



BIRDS OF PARADISE
AND
BOWER BIRDS

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AND
BOWER BIRDS

By
TOM IREDALE

With Coloured Illustrations of Every Species

By
LILIAN MEDLAND



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THERE has been no handbook to the *Birds of Paradise and Bower Birds*, and this has been a great drawback to their study. The present opportunity of providing a popular, yet scientific, account has been grasped with the hope that hereafter real interest will be taken in this group of curious and intriguing birds.

Therefore to the publishers, the thanks of everyone at all interested in bird-life must be gratefully tendered, and also to the printers, who have so successfully reproduced the excellent paintings provided by the artist, Mrs. Iredale (Lilian Medland); without these paintings the book could not have been prepared, and if dedication had been necessary the book must have been dedicated to her.

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TOM IREDALE.

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INTRODUCTION

IT seems unnecessary to explain what a bird is, as everyone is familiar with some kind of bird as the Domestic Fowl, Pigeon, Sparrow, Starling, Parrot, and so on, while a brief description of a bird is that it is a vertebrate animal covered with feathers and capable of flight. The whole system of the bird centres round the last named so that the bird has a small oval body, with a small pointed head and a tail supported by two wings, one on each side. There are two legs which may be short for perching or longer for walking. Many variations in the proportions occur as the birds have developed different methods of getting their food and living. In nature similar birds group themselves through this, as many carnivorous forms have developed short, stout, hooked bills for tearing flesh, long wings for catching their prey, and stout legs and feet with sharp claws for taking and holding their victims. On the other hand, glance at a Duck with a heavy body, strong wings, a flat long bill with strainers on each side and short legs but long toes with a broad web connecting the toes. When it is known that the birds have oil glands to safeguard the feathers from wetting too much we can realise that they may be swimming and diving birds. Such specialised groups consist of comparatively few members, although the groups as a whole may be represented in every portion of the world. But the great majority of existing birds are the smaller forms such as the Starling, Sparrow and so on, which have small thin or stout bills and small perching legs, which live among the bushes and feed on insects, seeds, etc. (The Starling and Sparrow now frequent houses, but naturally they live in bushes.)

Among the most famous of this immense group, which includes some five thousand different kinds, is a small series known as Birds of Paradise.

What is a Bird of Paradise? This name was originally given to a bird brought back from the East over four hundred years ago, and has remained in usage ever since, becoming enlarged to include almost any ornamented bird from New Guinea. So that today the Birds of Paradise are not all similar, but present many unlike forms which are only held together by the fact that they come from New Guinea and present ornamental plumage of peculiar design. There can be no definition given, as the birds vary in size from that of a Sparrow to that of a Dove, but many look much larger on account of the development of much loose plumage and sometimes very lengthened tails. These are generally illumined with iridescence which almost defies description, although attempt will be made hereafter. It was not the beauty of coloration alone that gained the name but the possession of long delicate plumes.

As above noted, birds are covered with feathers and these have been specialised in various ways to suit the living of the particular kind of bird. The head feathers may be very small and compressed to lessen air resistance or struggle through dense bush; they may be lengthened into crests, but even these are capable of compression flat against the bird's nape. The body feathers are generally soft and curved into body form for covering and warmth and do not vary much, although sometimes they are lengthened and thickened. The wing feathers are long and stiff, strong enough to support the body and capable of movement in flight; they are

so shaped that they can fold up and fit into the body shape. The tail is the balancer and rudder and varies according to the flying power of the bird, being sometimes long in swift flying birds but in the fastest flying bird, the Swift, the tail is very short. The legs are short and slender with clutching toes, mostly for perching, the majority of these small birds hopping when on the ground. Thus generally speaking feather structure is strictly utilitarian, but having achieved that purpose continuance of evolution has been on aesthetic lines. Firstly the birds are of modest plumage for safety, but the male has developed brighter coloration of no use save as a sexual attraction, that is, judging by our standards. Many males have evolved crests on their heads, and wattles, fleshy growths on the head and throat. (This is well seen in the Common Fowl.) Quite a few have lengthened tails which appear to be a hindrance rather than a help in flying. The acme of uselessness in ornamentation appears to have been reached in the Birds of Paradise, as here coloration and feather structure appear in the male, making it a very beautiful creature, while the female has remained very ordinary. The peculiar feather structure is known as "plumes", and the development of this deserves a little explanation. If any feather be examined, it will be seen to be a wonderful object composed of many parts all formed on the same principle. The feather is embedded in the skin and from a barrel springs the stalk which is furnished on each side with fine hair-like filaments, but these in turn have on each side still finer filaments, those on the lower side provided with minute hooklets which cling to the neighbouring filament of the upper side of the nearest thread. This forms a compact object which if disturbed cannot be reset by human hands. However, from some unknown

cause the feather may lengthen, and first the hooklets disappear, then the secondary filaments, thus freeing the larger filaments which appear as delicate thread-like growths becoming more parallel to the stalk and these when bunched become known as plumes as a distinction from normal feathering. It should be noted that the filaments are of equal length on each side of the stalk, and while they are curved in the short normal feather, they become straight as they lengthen in the plume.

In addition to plumes Birds of Paradise commonly show iridescence and this is due to the exact opposite of plume growth. The stalk becomes short and flattened, while the filaments respectively follow the same course until the hooklets clasp more tightly so that the surface becomes plate-like, almost metallic in appearance. Such a surface allows the refraction of light and apparently a different colour is seen from each angle of sight.

Birds of Paradise may show great iridescence and plumes, but in each so-called Bird of Paradise the area of iridescence and the growth of plumes differ. One of the most notable features of birds of this group is their display of these beauties. The males appear to understand that they are beautiful and amuse themselves as well as any spectators by displaying their plumes. It seems that birds are gifted in their recognition of beauty, and that having somehow developed some beauty they must show it off to others. Nothing more need be here said as much will later appear.

All so-called Birds of Paradise live in New Guinea with the exception of three, all of the same minor series, which have travelled down the East Coast of Australia. One of the most curious items in their distribution is that they do not occur in New Britain, although it is only a few miles distant from New Guinea.

NEW GUINEA

Even as Australia has been termed the "Land of Living Fossils" so has New Guinea earned the title of "Land of the Bird of Paradise".

New Guinea is the largest island in the world, now that the claim of Greenland has been disposed of, and while Australia is regarded as the Island Continent. It is a curious shape, having been likened to a prehistoric bird or a legless lizard, not the snake-like form sometimes mistaken for a snake, but a big-headed form with a narrow neck and a rather bulky body tapering to a tail. From end to end of the main island it reaches nearly fifteen hundred miles, and at its greatest width nearly four hundred miles. It lies entirely within the tropics, the equator just passing to the northwards and the south-eastern tip about eleven degrees to the south, and from about one hundred and thirty degrees East (including the outlying islands) to about one hundred and fifty-five degrees. It has an area of over three hundred thousand square miles and as a whole is very mountainous. The head is composed of high mountains ranging up to 10,000 feet, while there is a long, very high range running almost the entire length, recalling a backbone, reaching up to nearly sixteen thousand feet with many altitudes up to twelve and thirteen thousand feet nearly to the eastern tail piece. Many large rivers arise in these mountains, due to heavy rainfall which may reach over three hundred inches per annum in the highlands and even average over one hundred inches on the lowlands, but of course, owing to the extent of the country, great local variation must be found, and there is little accurate information available yet. The climatic conditions vary accordingly, but very rarely does the temperature exceed 100 degrees,

whilst according to the altitude of the mountains it decreases to the snow clad peaks of the highest. The mid-south is mainly flattened delta country, while the mountains are generally well forested.

Under such conditions Birds of Paradise flourish, generally keeping to the highlands, and it has been found that they have allotted themselves altitudinal limits but that these limits vary geographically. A few kinds do occur on the lowlands but the majority are dwellers of the high forests of the mountains, even reaching up to 13,000 feet. The country has been little explored yet, so that the natural limits are not well known, especially as the birds appear to be localised in their habits. A number of expeditions have been made into the North-West head (the Vogelkop), yet some birds living there are not at all common, and all the expeditions into the other parts have been of small extent and duration, comparatively speaking. Hence it can be stated that there is great opportunity still awaiting the student in almost any part of the country.

The limits of the New Guinea area include the western islands of Waigiou out of Guebe and the Aru Islands, but not the Kei Islands, and on the east of the D'Entrecasteaux Group, the Louisiades, and the Trobriands, but not New Britain and the adjacent islands, while for the range of the Birds of Paradise Eastern Australia must be added. The islands of Halmahera (Gilolo), Obi, and Morotai appear in this place, because although they are not inhabited by Birds of Paradise and do not belong to the New Guinea area, two very different birds have been included in this series and will be dealt with in order to prove that their exclusion is necessary.

LOCAL DISTRIBUTION

This is an important matter owing to the extent and topography of New Guinea, so that some introductory remarks must be made. The earliest known birds came from commerce with the natives, and most of the specimens had been procured on the western islands or from the western head of the mainland known now as the Vogelkop, but the localities cited are the Arfak Mountains and Dorey Harbour, a favourite resort for the early voyagers, now called Manokwari. This is now Dutch, but was apparently claimed as a British possession by Hayes in 1793, who wrote: "I took possession of the whole surrounding Coast on account of His Britannic Majesty and Nation. I am well assured it will be a source of Aggrandisement and Riches to Great Britain if nurtured; surely at least the Convicts will be sent to New Albion (which name I have given to the whole East side of New Guinea) instead of that wretched and unprofitable place Botany Bay." His action was not confirmed and Australia was left to develop in peace.

The Vogelkop is mountainous and the Birds of Paradise were secured without knowledge of their habitat, so that it was not until Lesson and Wallace recorded notes of these that the study of distribution began. Odd notes were published later, but the first picture was presented when the Australians under Macgregor undertook the government of the South-East portion of the island. Goodwin, who accompanied the first attack on the mountain ranges, wrote up the birds in diary form, and his account may be here quoted in full as it is classic, covering every point desired as to altitudinal habit. "On the banks of the Vanapa River we heard the cry of the Twelve-wired Bird of Paradise (*Seleucidés niger*), but, time not permitting us to go hunting, we did not procure

a specimen of this, one of the finest birds of the whole family. The Twelve-wired Paradise-bird inhabits the swampy districts near the coast, where it is not easily obtained. Its call can be heard at a long distance and is a double note, difficult to imitate even by the natives . . . We ascended the lower mountains, where we encountered the King Bird of Paradise (*Cicinnurus regius*), of which we secured several specimens during our first day's march. A restless little creature, not easily seen in the dense scrub, nor was it met with above an altitude of 2,000 feet. Its food consists of seeds and berries. The next Paradise-bird met with was the Raggi's Paradise-bird (*Paradisea raggiana*), which is also found on the lower ranges of the mountains, and is rarely ever seen above an altitude of 3,000 feet . . . lives on fruit. The Magnificent Rifle Bird (*Ptilorhis magnifica*) on Mt. Kowald, as also on Mt. Belford, at an altitude of 3,000 feet and over. This bird haunts the dense scrub, usually in the neighbourhood of the running streams. It is solitary and wild and shy. On Mount Belford, at the altitude of 4,000 feet, we first heard the call of Lawes's Paradise-bird (*Parotia lawesi*). On Mount Musgrave at the same altitude our camp was near one of their play-grounds, so I had a good opportunity of watching this bird's movements. It has a strong resemblance to *P. holosericeus* both in form and habits. It has a similar bill, beautiful blue eyes, and strong legs, and, like the Bower-bird, is very cautious, restless and swift. It has also a similar flight. Although *P. lawesi* does not build a bower, still it has its play-ground, where a number of these birds (from six to eight) may be found playing together. The play-ground may be easily known by the colour of the soil and by the clearance

of the surrounding underbrush . . . The Sickie-billed Paradise-bird (*Drepanornis cervinicauda*) resorts to the same zone, but is very seldom seen. We were unable to sight one, although we heard its call several times during our stay in the mountains. It keeps to the topmost branches of the highest trees, where it pours out its song, which is said to resemble that of the Nightingale . . . At an altitude of 5,000 feet we came across the Superb Bird of Paradise (*Lophorhina minor*). This species flutters about on the highest perches it can find, and looks no larger than a butterfly. It is needless to say that few specimens of it were secured. Its call is similar to that of *Parotia lawesi*, but is not so strong. The most striking feature of this beautiful little bird is its cape, which it has the power to expand so as to form a half-circle over its back . . . On Mount Musgrave, at an altitude of 6,000 feet, we also came across a fine species of *Epimachus* (*E. macleayanae*). This bird differs materially from *Epimachus maximus* in that the breast and flank feathers are of a rusty colour shaded with purple. It inhabits the mountain regions at an altitude of from 6,000 to 9,000 feet, above which no Paradise-birds were found. The call of *E. macleayanae* is a shrill double note, similar to the striking of a pair of clappers . . . In the same locality we procured several female specimens of the Stephanie's Paradise-bird (*Astrarchia stephaniae*), being the first examples of that sex yet discovered . . . *Diphyllodes chrysoptera*, it is safe to say, is only found in the interior, as we did not come across it until we were on the Knutsford range."

A later observer confirmed these data, so that a key can be appended.

Lowlands—*Seleucidés*.

1,000-3,000 feet — *Cicinnurus*, *Paradisea*, *Craspedophora*, *Diphyllodes*, *Manucodia*.

3,000-6,000 feet—*Lophorhina*, *Parotia*, *Drepanornis*, *Paradisornis*.

6,000-8,000 feet — *Epimachus*, *Astrarchia*.

Later expeditions found two new forms at higher altitudes, 11,000 and 12,000 feet, *Macgregoria* and *Cnemophilus*.

When later modern expeditions were undertaken in New Guinea, the above data were remarkably confirmed with a few exceptions and with a locality factor present. Thus some of the above were represented by related forms at the other end of the island at slightly different altitudes, and it has been suggested that on the sheltered slopes the birds may ascend higher than on the weather-bound heights. Again, in the western part the mountains ascend slightly higher and consequently the altitudinal variation is more, that is, it is colder at a lower height than a corresponding absolute height in the east. Such interesting problems will only be solved in time with local co-operation. However, even in connection with South-East New Guinea, whence the above observations were made on the southern slopes, a few years later a visit to the northern slopes allowed comment as: "On the slopes of Mt. Maneao at 1,500 feet a female *Drepanornis albertisii* was obtained. I do not think this bird has ever been shot at such a low elevation . . . The shooting boys got a quantity of birds, and amongst them were two sexpennes (sic); 1,500 feet is a very low altitude for this bird." The British Ornithologists' Union Expedition to South-West Dutch New Guinea met with *Epimachus* and *Astrapia* as low as 4,200 feet, and added *Paradigalla intermedia* at 5,500 feet. Blood only secured *Paradigalla brevicauda* at an altitude of 10,000 feet in the Mount Hagen district. Beck, however, mentioned how these altitudinal limits varied in even short distances: the Rifle Bird at Meganum, and at Keku; forty miles south not one of these birds was

heard until a height of more than two thousand feet was attained, whereas behind Finschhafen, one hundred and fifty miles south of Keku, one was heard at 500 feet and others frequently below

2,000 feet. So that all present altitudinal data must be regarded as only provisional and capable of great alteration with more knowledge as to distribution, and not useful for comparative or analytical purposes.

BALANCE OF NATURE

It is indeed fortunate that these gorgeous birds are not commonly found on the lowlands, but that the great majority live in the dense, almost impenetrable forests of the mountain heights. As long as they carried a bonus on their head as a commercial object, so long were they under sentence of death even in their refuge. Now that better feelings have given them a fresh lease of life by condemning the usage of their plumes for the adornment of human females, hopes for their future survival are bright. But feeling the loss of their monetary gain, opponents keep arising claiming that they may do damage to fruit crops, and therefore owners should be allowed to kill them. Be it well noted that only old males in fine plumage are to be the villains to be sacrificed; there are no young hooligans in nature.

Twenty-five years ago an appeal was made by a dealer to be allowed to kill them for their plumage for sale as "the birds are still to be found in millions."

Such a grotesque statement secured its proper judgment and the appeal failed. A more subtle approach might have had a different result, and soon the "millions" would have been sacrificed merely for just for money. It must be always remembered that when the Germans first took Northern New Guinea they destroyed thousands as the venture was a commercial project and all easy money had to be garnered. The Company did not succeed even with this golden asset, as it soon declined, and it took years for the birds to recover from the slaughter.

A disturbing factor in the peaceful life of the Birds of Paradise has been brought to light recently in the matter of timber permits in New Guinea. As long as the timber remains so long will the Birds of Paradise persist, but if large scale deforestation be allowed the extermination of these birds will be merely a matter of time.

EGGS

It has been considered unnecessary to describe the eggs of the various Birds of Paradise and Bower Birds, as egg-collecting as a pastime is now abolished in the countries nearest, and no scientific approach has yet been made to the study of birds' eggs. It must be admitted that were eggs scientifically studied they might be useful aids to the classification of birds in some cases. However, before they would be available in the present connection many suggested relations would need

to have their eggs critically examined before any conclusion could be made.

The characteristic egg-type of Bird of Paradise is one splashed longitudinally from the larger end, a very beautiful egg. Hartert recorded many years ago the eggs of twenty-three forms and noted that these fell somewhat irregularly into groups. This splashed form was seen in the true Birds of Paradise and the Rifle Birds, a quaint combination, especially as the splashing was becoming obsolete in the

Superb and Six-plumed. This indicates the comparative valuelessness of the splashing. Then he noted that in the Manucodes the egg was merely normally spotted, a factor which could be adduced for their separation if coloration or colour-style in eggs were admitted. The egg of the Stephanie Bird has also been reported to be splashed.

As to the Bower Birds, their eggs showed no likeness whatever but were quaintly discordant amongst themselves. The Cat Birds, the Tooth-Bill, and apparently the Gardeners, have provided a uniform cream egg, while the Grey and Spotted show eggs curiously scribbled all round and round, and the Regent Bird has a similar egg, while the Satin Bird has a dark-coloured spotted egg. Nothing

much can be gained from this, as if it were acknowledged that the scribbled eggs indicated valid separation from the plain ones, it would also justify the inclusion of all the layers of scribbled eggs, and that would mean the arrangement of the Regent Bird with the Grey and Spotted Bower Birds. Every other item denies this. A better method of egg-study would be by means of the microscope, investigating egg structure and forming a basis, as we know that microscopic egg structure does differ, but it is not known what this means. It would certainly be worthwhile to have on record the most characteristic forms of egg structure as a beginning, but as above, egg collecting is ruled out for private collectors, and museums would be shy of allowing the dissecting of their egg collections.

HISTORY

The study of the history of the Birds of Paradise is very intriguing, as we follow the discovery and exploration of New Guinea, admiring the fortitude of the explorers who braved death and dangers which still remain in many parts.

The first record of a Bird of Paradise in Western Europe is bound up with the first voyage round the world initiated by Magellan (so called in English works). Magellan safely rounded the southern end of South America, being the first European to sail across the vast ocean which he called Pacific. He reached the Philippine Islands, where he was killed, but one ship, the "Vittoria", was brought back safely to Spain. Magellan was a Portuguese, but unable to get assistance in his own country, succeeded in convincing Spain, and so his results became credited to the latter country. It was an international affair, as the account of the expedition was written by Antonio Pigafetti, an Italian adventurer. When the vessel reached Tidore in

the Moluccas it was visited by the King of Bachian, who "also gave us for the King of Spain two most beautiful dead birds. These birds are as large as thrushes, they have small heads, long beaks, legs slender like a writing pen, and a span (palm) in length; they have no wings, but instead of them long feathers of different colours, like plumes; their tail is like that of the thrush. All the feathers except those of the wings are of a dark colour; they never fly, except when the wind blows. They told us that these birds come from the terrestrial Paradise, and they call them 'bolon dinata,' that is, divine birds." This is taken from the Hakluyt Society's translation, Vol. 52, 1874, where it is recorded that of Pigafetti's account four mss. were known, three in French and one in Italian. Also that an English translation by Richard Wren had been published in London in 1625. The gift took place in December, 1521, and the voyagers reached Spain on September 6,

1522. Pigafetti's account was issued as quickly as possible, and is the traditional one, but the erudite Newton in the Dictionary of Birds pointed out: "It is now certain that he was anticipated by Maximilianus Transylvanus, a young man who was residing in the Spanish court on the arrival of the survivors (only one vessel survived out of the five which set out) of Magellan's company, and promptly wrote to his father, the Archbishop of Salzburg, an account of their discoveries and spoils, sending moreover to him one of the wonderful birds they had obtained. This account (*De Moluccis insulis* etc.) was published in Cologne in the January following, and the native name of the birds, of which it seems that five examples were brought home, is given as *Mamuco-Diata*, a variant of *Manucodiata*, meaning the Bird of the Gods, a name which seems to be still in use." Newton then stumbled in adding a footnote: "Much of this description fits the only Bird of Paradise that inhabits Batchian, the ruler of which island, as above stated, gave the birds; but that species remained unknown to naturalists until Mr. Wallace procured examples in October, 1858, and it was subsequently described as *Semioptera wallacii*." This last-named, although known as Wallace's Bird of Paradise, has nothing to do with the New Guinea birds, and certainly the ones described by Pigafetti belonged to the traditional bird as accepted by authority. Many birds soon reached Europe, both through Portuguese and Dutch sources. Many figures appear in the early books dealing with Natural History, and some of them were drawn from legless skins, while others showed the legs even as the "honest" Pigafetti had mentioned. It is pretty certain that skins had reached the Asiatic mainland, perhaps even centuries earlier, but no record is available. Newton also pointed out that Belon, who travelled in the Levant between 1546-49,

mentioned "among the feathery adornments of the Janissaries, plumes which could hardly be other than those of these birds, and expressly states that they were obtained from the Arabs. He said they belonged to birds called *Rhintaces*, which some modern writers identified with the *Apus* of classical authors, though he himself thought they were the feathers of the Phoenix."

But *Apus* would have been a good name for the legless feather forms probably reaching the Arabs from the Far East.

Although Pigafetti had expressly mentioned the feet of the birds, some writers, seeing only the legless (and wingless) trade skins, denied the existence of such mundane necessities. This seemed to be confirmed when John Huyghen van Linschoten, who had made a voyage to the East Indies, wrote: "The Ilandes of Maluco are five, viz, Maluco, Tarnate, Tydor, Geloulo, and another where the Portingales have 2 forts, that is in Tarnate and Tydor which long since were discovered (by Abreu and Serrane 1511) and wonne, where they trafficke from Malacca and out of India. In these Ilands onlie is found the bird, which the Portingales call passaros de Sol, that is Fowle of the Sunne, the Italians call it *Manu codiatas*, and the Latinists, *Paradiseas*, and by us called *Paradice-birdes*, for ye beauty of their feathers which passe al other birds; these birds are never seene alive, but being dead they fall on the Ilands: they flie, as it is said alwaies into the Sunne, and keepe themselves continually in the ayre, without lighting on the earth, for they have neither feet nor wings, but onely head and body, and the most part taylor, as appeareth by the birdes that are brought from thence into India, and some from thence hether, but not many, for they are costlie. I brought two of them with me for Dr. Paludanus, which were male and

female, which I gave unto him, for his chamber."

A mere comparison by Acosta noted: "They bring certaine birds from *China* that have no feete, and all their bodies are almost feathers. They sit not upon the ground, but hang upon boughs, by strings or feathers, which they have, and so rest themselves, like flies or aierie things." This citation becomes malformed in a popular book thus: "The residence of this bird was said to be in the earthly paradise. It was believed by the credulous and ignorant, the most numerous class of men, that it lived alone upon the air and dew; that it had no intrails, nor feet; but remained perpetually floating upon the air, while sleeping, as well as while awake; while hatching and laying as well as while procreating its young," adding, "Instead of a stomach and intestines, which, to so extraordinary a feeder, would have been useless, the cavity of its abdomen was said to be filled with fat."

The above reference to China brings to mind that the Chinese, recognising the value set upon these birds by Westerners, manufactured many "new" kinds by skilful manipulation of pieces of feathers, and these artificial birds were duly illustrated and described in some of the natural history books such as Seba, who added three to the then already crowded list.

An amusing note arose out of the fact that Marcgrave, dealing with the Natural History of Brazil, included an account of the Bird of Paradise. This was incorporated in a popular work which gave a delightful little woodcut with the following information: "The Bird of Paradise has been called so, we may fairly suppose, on account of his being generally seen on the wing, and flying in the torrid zone at a small distance from the land, Its appearance being most welcome to the tired sailor and longing passenger, generally

causes much happiness by its foretelling the vicinity of *terra firma*. The head is small, but adorned with colours which can vie with the brightest hues of the peacock's embellishments; the neck is of a fawn tint, and the body very small, but covered with long feathers of a browner hue, tinged with gold; the two middle feathers of the tail are little more than filaments, except at the point and near the root. This bird's feathers have not only been the favourite ornament of the South American ladies for a long time, but have had also the honour of decorating the heads of our fair countrywomen."

It would not be worth while to follow the controversial accounts regarding the feetlessness of this bird, as this was upheld by such an authority as Aldrovand; thus more than one hundred years ago it was written: "Pigafetti was scolded by Aldrovand, and even by Scaliger, as a most audacious heretic in science, for daring to say that the birds of paradise had feet, although he had actually seen them using these organs in perching." It will be noted that Pigafetti never claimed to have seen living birds.

Clusius gave a detailed account of the specimens he had seen as they arrived in Holland, and especially noted that some specimens retained the legs while others were legless, while Willoughby printed a very full account figuring four kinds on Tab XI, Manucodiata, Aldrov, The Bird of Paradise, Manucodiata 2 Aldrov; Manucodiata wormii, Manucodiata altera Nieremb. Chap. XII (p. 90) is entitled: "Of the Bird of Paradise, or Manucodiata, in general," and began thus: "That Birds of Paradise want feet is not only a popular persuasion, but a thing not long since believed by learned men and great naturalists, and among the rest by Aldrovandus himself, deceived by the birds dried or their cases."

The Aldrovandian error was confirmed by Johnston and thus gained wider publicity as Newton gives a footnote, "The *Historia Naturalis* of John Johnstone or Jonston, of Scottish descent, but by birth a Pole, ran through several editions during the seventeenth century, but is little more than an epitome of the work of Aldrovandus." While Johnston maintained that the birds were legless, he added: "Of a verity they must necessarily require rest, and are with ease suspended to the branches of trees by those threads in their tails."

Bontius, however, had reported: "Birds of Paradise are so far from having no feet, that they have crooked sharp claws, and are of the rapacious kind, for they fall upon very small birds, tear them in pieces, and devour them. Neither is it true that they are never to be met with till they are dead; for the inhabitants of Ternate, in the East Indies, will shoot at them, and kill them as they sit upon trees. They fly backwards and forwards very swiftly, like swallows; for which reason some have given them the name of East Indian Swallows." These birds do not, however, live on Ternate so that the whole note was disbelieved, but it is now known that Birds of Paradise will kill and eat small birds, though that also was long regarded as erroneous. Time passed without any great increase of knowledge of these birds until the year 1726, when Francois Valentyn published an excellent account of first-hand knowledge in a large work dealing with the East Indies. When Valentyn came to deal with the Natural History, he described and figured the different kinds of Birds of Paradise known, without prejudice. Thus six kinds are well differentiated and these provided the basis for the first scientific approach by the great and learned Johann Reinhold Forster. The title of Valentyn's work will be given in the Bibliography, but in Vol. III, under

the heading *Verhandeling der Vogeln*, on p. 306, *De Paradys-Vogel* is discussed; its history given, and on p. 307 there is a hint that in a book published at Padua eighty or ninety years before, called *Deliciae Italiae*, there was recorded a living Paradise-bird brought from the Aru Islands.

Then followed the different kinds:

- I De groote *Aroeesche* Paradys-Vogel.
- II De kleene *Papoesche* dito.
- III } Twee Paradys-Vogels, die zwarte
- IV } zyn.
- V De witte Paradys-Vogel.
- VI De onbekonde zwarte Paradys-Vogel.
- VII En het Konings-Vogeltyē, dat 'er mede onder geteld werd.

This, as will be seen, was written in Dutch, but the work was translated into English in 1779 and French in 1780.

The part dealing with the Paradise-birds was translated into German by J. R. Forster to be included in an Indian Zoology based on Pennant's sketch of 1769 with many additions, and published in 1781. In this essay Latin names were given to Valentyn's descriptions. Later again, in 1791 (with a title page lettered MDCCXC) an English translation of Forster's work was made, at Pennant's suggestion, by Aikin, Latham and Davies, who compiled an Indian Faunula. In this Faunula Indica twelve kinds of Birds of Paradise are listed, including the Valentyn ones.

But simultaneously with the English translation of Valentyn's work, which is very rare, Captain Thomas Forrest published *A Voyage to New Guinea and the Moluccas*, wherein there appears, p. 88: "Jan. 1775 Arou Baba, Nerth of Waygiou. They were Papua men, and presented me with several birds of paradise, which they had got from New Guinea." P. 111: "Feb. 1775. Dory Harbour . . .

returned from Wobur. They also brought birds of Paradise, which I purchased from them." P. 141: "Mysol Mch. 1775. I returned on board in the evening, with the black loory (the only one I ever saw) which I had purchased; also some dead birds of paradise with their feet on. The black loory soon died. At Linty (S.E. Mysol) I learnt from the gentlemen who had entertained us, that the birds of paradise come at certain seasons, in flocks, from the eastward, or from New Guinea; that, settling upon trees, they are caught with bird lime, then their bodies are dried with their feathers on, as we see them in Europe."

Then followed Valentyn's account of the Birds of Paradise, translated by Dr. Forster, who favoured Forrest also with the following remarks: "This account in English of Valentyn's Birds of Paradise is practically the same as the one appearing in the Indian Zoology above noted." P. 149 footnote. "On Mysol, besides the common bird of paradise with feet, I got a black bird, with very long tail, and without wings; also, some small birds, with wiry shafts in their tails, and a most beautiful plumage."

In 1758 appeared the *Systema Naturae* by Linnaeus, which began modern scientific classification. This will be treated in the succeeding chapter, but here will be continued shortly the history. So much disbelief had entered into the minds of students that although Labillardiere wrote as follows: "Waygiou Aug. 1793. The island of Waygiou, which the inhabitants call Owarido, is covered with very large trees, and appears throughout a mountainous country; the land is pretty high, even at a small distance from the shore . . . During our stay in this island, I was constantly visiting its forests; I there gathered a rich collection of new plants, and I killed a great many scarce birds, among others the species of promerops, which

Buffon calls the promerops of New Guinea." This locality is not given in recent lists for any form of *Epimachus*. At one time a suggestion was made that the island might be the home of the wonderful *E. ellioti*, but that has apparently been abandoned, and Labillardiere's record also.

A few different species came to light without record of collector, and the earliest definite bird described with exact locality seems to be the Rifle Bird of New South Wales, the furthest away from the home of Birds of Paradise. But here again the name of the collector is missing, merely a Rifleman of New South Wales. It must be recalled that New Guinea was an inhospitable country, and save for contact with the Moluccas through the Vogelkop and the Harbour of Dorey, very little attempt at exploration was made until comparatively recent times.

Arago mentions that the Waygiou natives gave the men of the French exploring vessel *Uranie* Birds of Paradise stuffed with wonderful skill, but no mention of any collecting was made.

The first European to report accurately upon Birds of Paradise was the great French naturalist Lesson, who stayed less than a fortnight in New Guinea. He was an excellent observer, but also the medical officer, and complained that his medical duties gave him little time to study birds. He wrote: "The Birds of Paradise, or at least the Emerald (*Paradisea apoda* Linn), the only species concerning which we possess authentic intelligence, live in troops in the vast forests of the country of the Papuans, a group of islands situated under the equator, and which is composed of the Aru Islands, Waigiou, and the great island called New Guinea. They are birds of passage, changing their quarters, according to the monsoons. The females congregate in troops, assemble upon the tops of the highest trees in the forests,

and all cry together to call the males. These last are always alone in the midst of some fifteen females, which compose their seraglio, after the manner of the gallinaceous birds." He notes that he only met with two kinds in nature, but that the natives brought their skins in abundance and that he thus procured some half dozen more kinds. These aroused an enthusiasm in this group that never abated, as after his return to France he wrote many natural history books, not the least of which is his *Monograph of the Birds of Paradise*, extracts of which appear in many places. More will be written about this in the next chapter, as he was a great systematic worker. He did not discover many new species, as his visits were to the places from which most of the bird skins which reached Europe had been sent.

As the monograph was written in French its value was not realised in Britain, so that the way was left open for Wallace. One of the most famous figures of the last century, Wallace began as a commercial natural history collector, and while in the East Indies thought out some ideas of natural selection. These he forwarded to some of his friends in England, and they realised that he had arrived at the same conclusions as their other friend, Darwin. It was agreed that the two papers be read at the same meeting, and these began the modern study of evolution. Wallace, when he came back to find himself almost as famous as Darwin, wrote about his travels in the Malay Archipelago, which was his name for the Moluccas, and even included New Guinea. He had been interested in Birds of Paradise, and after writing some articles included an excellent account in his book. This account has been extensively quoted ever since, although there was very little novelty in it. Like Lesson he had only travelled over old ground and added little

really new, but it was written in English. It seems that this may have inspired Elliot, who provided the first large illustrated folio of Birds of Paradise; the birds are magnificently drawn and coloured.

Almost every nationality has taken part in the discovery and description of Birds of Paradise, and now Italians come again into the picture with Beccari and d'Albertis. The former was a professional naturalist-collector and the latter an explorer-collector, and they both collected in the same old Vogelkop, after which d'Albertis explored the south-east and the Fly River. Simultaneously a German, A. B. Meyer, collected in the north-west and north, as did Bruyn and Bernsteig.

The scene changed to the high mountain ranges in the south-east, which seemed accessible, and Hunstein led the way, getting only a short distance in, but reaping a good harvest. A little later Forbes also failed to get to the mountain ranges, while the Australians kept pegging away near the coast and picking up a few crumbs. Then came Macgregor who, appointed to administer the newly annexed part of south-east New Guinea, made it his business to explore thoroughly the whole of his "kingdom". He climbed to the highlands and was accompanied by good naturalists, Kowald and Guilianetti, and he made splendid discoveries in the highlands. As always, someone new then came in the field, but this time a stay-at-home (as regards New Guinea) ornithologist, Rothschild, who instructed everyone in New Guinea to look out for these birds for him, and also initiated collecting expeditions, Meek being the best known collector. A number of novelties was turned up and the range and distribution of many species were enlarged. The British Ornithologists' Union then sent an expedition into the South-West, a locality untouched since the early Dutch days, and

they added a little. More recently the Americans, under the leadership of Archbold and at his expense, have made modern methods unravel secrets in the unknown centre. By the use of the aeroplane, places beyond the easy reach of foot travel became accessible, and in the future all

the treasures still hidden will be revealed. The latest results have come from Mr. N. B. Blood, who, located in the Mt. Hagen district well in the centre, discovered a field of great richness, indicating that the whole story of the Birds of Paradise is not yet told.

CLASSIFICATION

The most important part of bird study is the critical examination of everything to do with a bird, with the aim of placing it next its natural neighbours in an orderly manner. Many factors are necessary, especially in the clarification of such a complex group as the birds called Birds of Paradise. The external features must be very carefully examined and then, if possible, the internal structure compared and contrasted with that of other apparently related bird forms. The habits must be taken into consideration both generally and particularly. It must be remembered that the general appearance of a male Bird of Paradise may be misleading owing to the extravagant adornment that may have developed.

Present day classification is based upon an ascending theme, beginning with the lowest forms and going upwards until we reach the highest, which today is occupied by Man himself. The Mammals are regarded as being the highest group, Man being the ultimate earthly evolution in that group. But immediately below come Birds, and here again we try to arrange the birds from the lowest to the highest form, and this is where trouble is met. In this group many different steps have been taken to provide the best means of survival, and it is admitted that the small Passerine forms are the most highly developed, even as they are the most numerous. Which of the many Passerine groups can be claimed as showing the

most development is a question that cannot be answered save in a very tentative manner. In recent years at one time Thrushes were selected, at another Finches, at a third Crows. The argument for the last-named interests us at this stage. Such a statement as "The Crow is the great subrational chief of the whole kingdom of the Birds; he has the largest brain; the most wit and wisdom," savours of hysteria rather than scientific approach. The conclusion was reached through the study of few members of the Class, and it may be noted that one of the supposed important characters was the fact "that the young were at once clothed in a plumage essentially of the adult." In view of this item the location of Paradise-birds near Crows is extraordinary, for the difference between the young and old is very remarkable. However, this matter will be returned to later, as now the growth of the present classification will be traced and discussed. The early history has been briefly noted, and when Linne drew up the Xth edition of the *Systema Naturae* in 1758 he introduced a genus *Paradisea*, which he also spelt *Paradisaea*, and it is a moot question which may be correct. Anyhow, the name was taken from older authors who used both, though apparently *Manucodiata* was preferred when the early references are examined. In this genus Linne admitted two species only, although as many as seven had been separated, even more including the artefacts.

To the first he added the trivial name *apoda*, thus bringing into prominence the absurdity of the claim to feetlessness that had been so much written about. The second one was named *regia*, as although the smallest kind known, it had been called the King of the Birds of Paradise. About eleven references to early writers were given in the first case and seven in the second. Of course in such a list as the *Systema* no comment was made on the species. Linne was primarily a botanist and secondly a systematist and very little of an ornithologist. He located the genus between *Gracula* and *Cuculus*, clearly showing his lack of bird knowledge. A couple of years afterward Brisson issued his *Ornithologia*, one of the most remarkable works issued to that date. It consisted of careful detailed descriptions of birds he had examined, and excellent illustrations were added. He called "Le genre de l'Oiseau-de-Paradis" *Manucodiata* and gave a very complete bibliography of all the writers who had noticed these birds, quoting all the plates. An accurate description was added. "It appears as large as a Pigeon though really the body is not much bigger than that of a Starling." Drawn up from a specimen from the Moluccas sent to M. de Reaumur by M. Godeheu: Comment reads Nos. 1, 3, 5 described by Aldrovandi, the two by Clusius, the two by Nieremberg, and the two by Marcgrave are all one and the same species, while the second species of Aldrovandi is a bird of another group and the fourth indeterminate. An excellent figure of the large bird showing plenty of feet was accompanied by another of the King bird, scarcely larger than a lark, from Amboina, in the cabinet of M. l'Abbe Aubry, also showing large feet.

It must be remarked that both Linne and Brisson seem to have been unaware of Valentyn's work, where at least six credible species had been differentiated.

The next step forward was by Sonnerat, who published *A Voyage to New Guinea*, although as far as the facts are known, he did not reach the mainland, but only the island of Gueby, which, however, belongs zoologically to New Guinea. Sonnerat figures six Birds of Paradise and two of Promerops (now classed as a Paradise-bird). Of these six species of Birds of Paradise two are anciently known, one has been known only a short time, the other three are new, as are the two Promerops. The first species, known under the name of Bird of Paradise, has given the name to the entire series; it has been so often described that it appears useless to repeat what has already been said. The second species is that which has been named the King Birds of Paradise. This species is known; it has been described, and pictures have been published, some coloured; but all give only an imperfect idea, since they have without doubt been drawn from imperfect models. He added: "Their Chiefs used the skins as ornaments and headdresses and for this purpose in preparing the skins they cut off their legs. The Dutch, who deal with them, purchase the skins thus prepared and take them to India and Persia where they sell them very dear to the rich inhabitants who also use them as adornments for their turbans, for their war helmets, and even as headdresses alone. It was thus thought that these birds had no legs, and this fiction was nursed by the Dutch who were thus enabled to command higher prices on account of the greater difficulty in procuring the skins."

Sonnerat was not a systematist, so no scientific names were given by him to the birds described and illustrated. These were introduced by Scopoli some ten years later, but in the meantime two other systematic workers had proposed names for the same species, viz., Forster for the species described by Valentyn, and Bod-

daert for the birds illustrated in the *Planches Enluminees*. It may surprise modern students to find the first scientific account being printed in a book entitled *Indian Zoology*, but at that time India covered all the islands reaching from India to New Guinea. Thus Englishman Thomas Pennant wrote a short essay on Indian Zoology and the learned Johann Reinhold Forster asked for permission to publish a German translation with additions. This eventuated, and an essay on the Bird of Paradise and the Phoenix was included. Forster pointed out that the Phoenix could not possibly be confused with the Birds of Paradise, and then gave the Birds of Paradise as listed by Valenty and allotted scientific names to the species. This is the first time that scientific names were given to the forms excepting the two listed by Linne. However, the work by Forster did not reach England commonly, so Pennant suggested that an English translation be made as noted above.

Reading this translation, Forster began his essay, "The Birds of Paradise are a genus of birds scarcely as yet sufficiently known to the ornithologists, because few of them are imported into Europe, and those, too, mutilated in their feet, wings, and other parts, or distorted by having a stick thrust within their skins, and thus too much lengthened. No real naturalist ever had the fortune to see a live Bird of Paradise, or to have observed their manners and economy; for they inhabit a region visited by very few Europeans, since scarcely any but sailors and merchants are permitted to penetrate into the remotest east, the country of the Paradise-birds. The history of this genus is therefore still full of falsities, or rather buried in such darkness, that we can scarcely hope to gain more and truer information concerning them, till some person, by a journey into these parts is enabled, by his

own observations and experiments, to give the public some accounts more ample and exact than we hitherto possess." This was published in 1769 and in the 1790-1 edition is a footnote by Pennant reading: "Sir Joseph Banks did me the favour of communicating the drawing of the common Bird of Paradise, brought alive to England, drawn from the life." On the title page of this edition is an engraving by P. Mazell, the leading delineator of natural history objects of his day, of "The common Bird of Paradise, with a view of Dory Harbour in New Guinea", apparently a reproduction of Banks' drawing.

Soon after this Francois Le Vaillant published a series of large illustrated Monographs, first of the Birds of South Africa, where he had travelled and collected, then of Parrots, and then of Birds of Paradise. These magnificent works began a new era of bird illustration, and as he was a great enthusiast but not systematist, the works are commonly cited, but no scientific names were given. Previously there had been issued the great *Planches Enluminees*, but in this work there was little system or order, although the plates are always quoted, as later scientific names were given by many workers, Boddaert being one of the first, only two years later than Forster. But such matters are only of technical interest, and will be mentioned in their proper place.

These early ornithologists crudely classed together a series of Birds of Paradise, mainly on account of their adornments, even as is done today, but did not include the long-billed forms which were widely separated and placed near the Hoopoes. But they recognised the fact that the birds were not closely related by providing distinct genera for nearly all of the species. Here may be interposed an indication of the terms, species and genera as used normally in scientific works. The term "species" covers an aggregation of

individuals of the same kind, governed by plumage changes from nestling to adult, the same colour system and similar structure of bill, wings, tail and legs and supported by internal features. The habits in nature are also of the same kind, so that the naturalist in the field is never in doubt as to what is a species, although this question has been long discussed by students working with dead specimens only. The distribution is governed by definite geographical limits, but in that range minor variations of colour shades and size may occur, and if these also be geographically limited, these minor forms are termed subspecies. When a major break occurs between species such as change of colour system associated with alteration in structure, though the general relationship is still clear, a generic distinction is allowed. It is noteworthy that such distinction was so early recognised in this group, at once suggesting the abnormal character of the series. As to family associations, these are generally easily recognisable, only a few curious genera causing difficulty. These will be discussed later, but at this stage nearly all the birds had been generically named, but not classed in one family.

Thus Lesson, followed by Gray, Bonaparte, and all the lesser lights, kept separate the long-billed, long-tailed species, although allowing the short-billed, long-tailed species to be associated with the true Paradise-birds. The revival of interest in these birds, consequent upon Wallace's popular accounts, which produced Elliot's Monograph, wherein the Sickle-Billed birds were included as well as the Bower Birds, influenced all later works, so that three-quarters of a century afterwards the same illogical association was being accepted, although in the interval the species had been doubled and our knowledge should have been increased many-fold.

Only three important workers may be mentioned in this connection. Gould, the greatest all-round ornithologist for nearly half a century, after preparing huge illustrated works on the Birds of Great Britain, Europe, Asia, Australia, began with New Guinea birds. Simultaneously he had issued Monographs of some of the groups, such as Trogons and Humming Birds. He then intended to follow with a Monograph of Birds of Paradise, but death intervened. The work on New Guinea Birds was continued by Bowdler Sharpe, the ornithologist at the British Museum, who then followed with the illustrated Monograph of Birds of Paradise, including the Bower Birds. This was completed just on fifty years ago, and no complete account has appeared since. Quaintly, two other unillustrated essays appeared simultaneously, a listing by Meyer, who had worked among the birds for many years, and a short descriptive work by Rothschild, who was taking the greatest interest in this group. Rothschild was no systematist, being occupied almost entirely with the separation of new species and sub-species, and the few genera he introduced, presumably on structural grounds, were obviously determined through colour-attraction. His colleague and keeper of his Museum, Hartert, was also little, if at all, interested in any group higher than a species, and all his great output on birds of the world, but principally those of the Palaearctic Region, consists of descriptions of species and sub-species, all the higher groupings being ignored, neglected, or depreciated. Meyer's work was also descriptive, and little contribution to the higher classification was made by him, although as a field naturalist he stands high in connection with this group.

Sharpe, on the other hand, was a fine, systematic worker, the best all-round ornithologist, and successor of Gould, and more interested in the higher classifica-

tions than any of his time. Therefore, after he had issued the plates of the Monograph of the Paradise and Bower Birds, he carefully discussed the classification. However, although it seems from his remarks he did not go deeply into this particular subject, his conclusions were more or less followed with little emendation. Sharpe classified the Bower Birds as a separate family, an obvious conclusion, but included with them some very unlike forms generally classed as Birds of Paradise. He then divided the latter into two sub-families, the black Sickle Bills; but here again admitted the "red" birds with curved bills, which seem out of place. As this scheme was issued before he adopted the evolutionary method of beginning at the lowest forms, it must be reversed for comparative purposes, so that it would begin with the Bower Birds, then the true Paradise-birds, and finish with the Sickle Bill series.

Here it must be emphasised that no linear arrangement will give any idea of the varied development of these birds as they are not all closely related. They represent the climaxes of many distinct efforts at bird adornment, and this ornamentation cannot be traced from one to the other, but there are great gaps between. So that a future systematist may distribute this series into its logical places, not placing them together as here shown.

Since the time of Sharpe, Rothschild, and Meyer, a lot of disconnected work has been done, mainly the description of new species and sub-species with one startling innovation. Little is really known of the distribution of bird-forms in New Guinea, as the major portion is still zoologically unexplored, so that a number of so-called Birds of Paradise were still represented in European museums by one or few specimens, mostly without locality, received from dealers in plume-skins. Some of the describers of these new species had drawn

attention to their apparent anomalous coloration and form and suggested they might even be hybrids. Over twenty years ago Stresemann got the brilliant idea of disposing of all the troublesome forms as being of hybrid form, and this has been accepted as being an easy solution of the problem.

THE HYBRID FANTASY

In nature bird hybridisation is very rare, although some groups are known to produce hybrids under unnatural conditions. Thus Ducks, Fowls, Game Birds, and Parrots, have been credited with wild hybrids, but these can almost be counted upon the fingers. It is now, apparently seriously, suggested that the so-called Birds of Paradise hybridise on a large scale, producing beautiful forms from the most unlikely parents.

Buffon, two centuries ago, wrote: "We know not what passes in the depths of the woods, nor, by what secret, but illicit joys, Nature may console those birds, who are deprived of an associate of their own kind. What happens in domestication . . . may happen also in a state of freedom. New species, however, have been produced among the passerine tribes, from the union of the bulfinch and canary; from the linnnet and the lark. Nor are these hybrid tribes barren, like the mules; but are capable of procreation, and adding to the variety of this order. There are many different kinds whose shape and manner so nearly resemble each other as lead us to believe such combinations are formed by nature herself in cases of necessity." It is astonishing to see this statement confirmed in this modern age with even less substance, as while we might object to the crossing of the linnnet and the lark, we are asked to sanction the union of some birds whose conjugation seems a physical impossibility.

In the latest list of Birds of New Guinea, the species of Birds of Paradise is reduced to thirty-five, no fewer than twenty described forms being dismissed as hybrids, the most astonishing debacle in ornithological history. A dozen Bower Birds are admitted without even one hybrid being named, although be it noted the earliest suggested hybrid in either series belonged to the latter, but was reported from Australia. All these supposed hybrid forms are here illustrated, and their sometimes whimsical parentage, as suggested, discussed, so that the matter can be seen in better perspective.

In the above-mentioned list, prepared by Mayr and issued in 1941, the Birds of Paradise and Bower Birds follow the Crows, and these are succeeded by Australian Nuthatches, Tree Creepers, Sunbirds, Honey Eaters, Flower Peckers, White Eyes and Weaver Finches closing the series. This sequence need not be taken seriously, as five years later the same author, with the assistance of his colleagues, completely upset it, and, leaving all the last-named away behind the middle of the series, finished in the following order, Drongoes, Orioles, Bower Birds, Crows and Birds of Paradise to head the list, the first time that they have been so elevated, and certainly not their due from any scientific approach to bird phylogeny and evolution.

PHYLOGENETIC CONCLUSIONS

Study of this group as here undertaken proves that no linear arrangement can possibly display their inter-relationship, which in many cases appears to be very distant.

Nearly two hundred years ago the word Crow was mentioned in connection with their size, and although it was obviously too crude, e.g., the King Bird, for contradiction, the word "Crow" has prejudiced

the location of the group ever since. Probably Cuvier was the first to place these birds alongside, but even he interposed the Rollers, and when these were removed the others were left together, a haphazard arrangement, so that shortly afterward a popular writer stated: "Ornithologists seem to agree in placing these birds either among the Crows (*Corvidae*) or in their immediate neighbourhood, and this, from the form of their beak and legs, and from their habits, to which we shall presently allude, appears to be their proper place." This statement was quite incorrect at the time, but soon afterwards the association grew, and has persisted to the present day. A very modern writer published for general information: "Birds of Paradise are believed to be resplendent relatives of the crow family. Indeed, the most primitive birds of paradise, the four species of Manucodes, look very much like small crows, except that the plumage has a more pronounced purplish or bluish sheen. Males and females in this group are coloured alike, although the males are slightly larger. Most persons would hardly believe that these plain birds are birds of paradise. Yet they are connected with the more bizarre types by an unbroken series of intermediate forms." Such misleading statements crowd the literature of these intriguing bird forms, and would fill a book, but paper is scarce and their individual contradiction is needless. The peculiar group here indicated, the Manucodes, forms a little isolated series without any connecting links with the other so-called Birds of Paradise, and they have nothing whatever in common with Crows save their dark plumage.

The clue to the relationship of some of the forms (for the series is undoubtedly polyphyletic, that is, of varied origin) was given almost three-quarters of a century ago, when that earnest disciple of Huxley, W. K. Parker, followed his master in dis-

cussing bird structure. He examined a number of odd types and drew comparisons with various known ones (not necessarily related species), and in connection with a Bird of Paradise he wrote: "Setting aside for the time all side-relationships, I should place the Bird of Paradise in a position almost exactly intermediate between the true Crow of the Old World and the Piping Crow of Australia; its morphology and its geographical distribution agree alike with this view . . . for any bird that should be like an exact cross between a Piping and Common Crow, would not be a *Paradisea*." Later it was found that the southern forms classed themselves together, and Newton wrote: "There can be little doubt of their forming part of the group indefinitely known as 'Austrocoracines' (The *Noto-Coracomorphae* of Parker), to which so many forms of the Australian Region belong."

Recent students have ignored this separation, from anatomical study, of the Australasian groups from those of northern climes, but this is the solution of many problems. From this southern group, whose ancestors are now well extinct, have sprung the many little southern series which have so perplexed workers in other countries. When the whole series of so-called Birds of Paradise and Bower Birds are viewed and studied in connection with Australian groups some easily fall into place while others are still of unknown relationship. Better local information will assist in the elucidation of the puzzles of New Guinea bird life, as these puzzles are not confined to the small section here under review, but appear in other sections also, e.g., *Eulacestoma* and *Paramythia*. It has been shown pretty conclusively that *Cracticus*, *Gymnorhina* and *Strepera* form a series, and it is from a Pro-Cracticoid stock that the Manucodes may have arisen. But *Cracticus* seems to be an offshoot of a group producing *Artamus*

and its allies, and both these may have arisen from a southern Flycatcher ancestor, the form that Parker designated as Struthious Warblers, symbolised by *Petroica*, the so-called Australian Robins. But these lead into the Scrub Robins, which may have produced the *Colluricincloid* series. The ancestor of such a series might also initiate the *Pachycephaloid* medley and on the other hand the *Coracinoid* group. This complex company would arrive at the *Noto-Coracomorphae*, and if investigation along these lines were carried out, a better grouping would arise.

It is axiomatic that the juvenile and female coloration give a clue to the evolution of the male, and this alone would suggest the wide divorce from the Crows. Newton, claiming their right to headship, wrote thus: "Significant colours, as for instance total blackness or whiteness, could be developed only when higher intellectual qualities, bodily size and strength, or occasionally even special smallness, guaranteed the safety of the bird. The females and young mostly retain a more sombre garb, and thus remain on a phylogenetically lower level. This consideration implies that whole-coloured birds, like Swans and Ravens, have reached their limit so far as coloration is concerned; since both black and white are very conspicuous and are correlated with a considerable amount of intellectual development. The very early assumption of the black plumage by the nestlings of Ravens and Crows is a strong argument for their relatively highest position on the hypothetical avine tree." This argument is fallacious, but can be used to discard the Crow alliance, as the Birds of Paradise show very low level female and young plumage. This may be used for linear arrangement, but it is not suggested that it is of great real value in this series. It may be noted that Pycraft, forty years ago,

wrote *On the Pterylography of the Lesser Bird of Paradise*, and concluded: "From what I have seen in the course of the preparation of this paper, I am inclined to believe that the Birds-of-Paradise are by no means so closely related to the *Corvidae* or to the *Ptilonorhynchidae* as is generally supposed at the present day." Forgetting all about Crows, and examining the birds themselves, it would appear the Rifle Birds, although showing extraordinary male plumage, offer the least specialised young and female plumage. Consequently the linear arrangement may begin with these, and following the female coloration, reach the Sickle Bills. Then there is a break in which the female coloration is similar but the male coloration is of a very different style: these are smaller birds and include the King and

the smaller Sickle Bills. From here the true Birds of Paradise may be reached with the strange Blue-bird as probably a more aberrant member of the Rifle Bird series. Standing alone come the Manucodes, finishing with some false Birds of Paradise, such as Wallace's, which is obviously only a glorified Friar Bird, and the Enamelled, which may be anything save a relative of any of the foregoing. A bird like *Macgregoria* may be a Honey Eater, and it has been recorded that it recalls this group in some of its habits. Its young is also black, so that it could claim high development. The position of each bird will be shortly discussed in the proper place rather than continuing a too lengthy preview here; but it must be emphasised that no Bird of Paradise shows any, even distant, relationship with any Crow.



RIFLE BIRDS AND THEIR ALLIES

Subfamily *Parotiinae*

Plates I to V

IT is curious that such a nickname should have achieved such greatness, as members of the series were known long before the name was coined.

The males are about the size of a Thrush, with a rather long, curved, laterally compressed slender bill, of a velvety black, with metallic reflections of green and purple on the head and throat, the wings short and rounded, the first wing feather narrow and curved, the succeeding ones becoming broader and even square-ended, the tail short, with the two central feathers slightly shorter and iridescent. The under-surface is also blackish, with green bands varying in breadth, the flank feathers long and full, sometimes developing into plumes. Quite unlike in appearance, and also in detail, the females are greyish-brown above, the under-surface buffish, marked with irregular black bars.

Barron Field, in a book dated London, Feb. 28, 1825, but with the plates dated "Publ'd Apl 23", published a "Glossary of the most common objects in Natural History of New South Wales and Van Dieman's Land", included "Rifle-bird *Ptiloris paradiseus*." The scientific name had been introduced only in January of the same year, where no local name was quoted. Later in the same year the French naturalists Lesson and Garnot, who were in Sydney in 1824, recorded that many had been killed at Port Macquarie some months before their arrival, and that the bird was commonly called at Sydney "Rifleman", as a soldier had killed the first individuals.

The ingenious Newton was not content with such a commonplace derivation, so

suggested that "probably because in coloration it resembled the well-known uniform of the rifle regiments of the British Army, while in its long and projecting hypochondriac plumes and short tail a further likeness might be traced to the hanging pelisse and the jacket formerly worn by the members of those corps." A little later Wilson figured the male and female, commenting: "These specimens were sent to the Edinburgh Museum, early in the year 1824, from New Holland, by Sir Thomas Brisbane, in honour of whom the species was then named. In the MS. Catalogue which accompanied them, dated Aug. 17 1823, Fig. 1 was marked 'No. 30 Velvet Bird, rare. This specimen was shot at Port Macquarie.' To Fig. 2 was appended 'No. 31, supposed female of the foregoing.'"

Swainson had introduced a new genus *Ptiloris*, with the trivial name *paradiseus*, but both the later writers referred the species to *Epimachus* only on account of the curved bill, as the original *Epimachus*, although dark in coloration, had an extremely long tail.

Some twenty years later Macgillivray discovered a second species in North Queensland which Gould dedicated to Queen Victoria, the first instance of one of this group being named after a ruler, but which was to be followed more extensively than anywhere else.

Twenty odd years previously Le Vaillant issued a collection of plates, large and handsomely coloured, entitled *Oiseaux de Paradis*, including Rollers, Jays, Toucans, Barbets, etc., and which proved so successful that he followed with a *His-*

toire Naturelle des Promerops, on which, p. 36, pl. 16, he figured the New Guinea representative of the above forms. Le Vaillant mentioned: "It was figured and described from a specimen in his own possession which came with other birds from New Guinea, and he only knew of four others, two in Holland, one in the Paris Museum, and one in the Bullock collection in London." Vieillot, ten years later, gave a scientific name to the specimen in the Paris Museum, which had been previously mentioned by Cuvier.

For some unknown reason Sharpe became very confused, and stated that Vieillot was the first to describe the unique specimen in Paris which had come from the Bullock collection. But the Bullock collection was not dissipated until after Vieillot's description had appeared, and it is not known where the Bullock specimen went, as no reference is made to its disposal in the sale catalogue reviewed by Sharpe. However, there is an illustration of it in some copies of the *Companion to Bullock's Museum*, of which eighteen or more editions were issued.

It may also be noted that this Bird of Paradise was not included in Le Vaillant's *Oiseaux de Paradis*, but among the *Promerops*, but nearly everyone has cited the former as a reference.

Some sixty years later than Le Vaillant this third form was found in North Queensland, and Gould, placing the three forms in the family *Epimachidae*, wrote: "Many authors place the three following birds in the family *Paradiseidae*; Cabanis makes them part of the subdivision of the sub-family *Epimachinae*. Mr. G. R. Gray retains them in the same sub-family, but makes it form a part of the family *Upupidae*. It has always appeared to me that they bear a strong resemblance to the *Climacteres*, preceding which I shall therefore place them."

It will be seen hereafter that a number of observers have noted the tree running of these birds, but no great value can be placed upon such a habit, as many birds occasionally indulge in it. Otherwise there seems nothing to claim any relationship with the Australian Tree-Creepers (which, by the way, have no close alliance with the Palaearctic Tree-Creepers), and these apparently can be dismissed from the search for the ancestry of the Rifle Birds and their associates.

In New Guinea, other Birds of Paradise whose males are clad in black plumage with somewhat unlike, more complex, ornamentation seem to be closely related through the female plumage, which is so much alike that these females have been confused by even good students. Such are the Superb, the Six-plumed and the Twelve-wired, which will be treated in detail, but their general features may be here sketched. The first-named is blackish all over, but has an extensive erectile nape frill, as well as a large, broad breast shield, the feathers of the former velvety and with shaped broad tips, those of the latter small and strongly iridescent, shading from bright green to blue, contrasting with those of head, which are small compressed shining metallic green to purple. There are two black tufts above the nostrils and a thick chin tuft with the tail short and the wing feathers comparatively normal.

The Six-plumed takes its name from the six feathers which have been produced from behind the eyes, three on each side, extending as long wings more than half the length of the body, ending in a small feather-tip shaped like a racket. These quaint feathers are very mobile, the bird being able to swing them in any direction, even well over in front. There is only a line of metallic purple feathers at the back of the head, but there is a small, glis-

tening, golden-green breast-plate. There is a chin tuft, while the feathers above the nostrils are stiffened and incurved of a silvery white or golden brown. The tail is very short and the wings are formed like those of the Rifle Birds, but in addition this bird has developed from each side of the body a series of feathers with stiff shafts and broad, loose, squarish tips. These feathers are also movable, and can be brought forward into an umbrella. It must be acknowledged that there are no words capable of describing the varied ornamental feather growths of the birds under consideration.

The Twelve-wired varies in that the black male has a yellow lower part coloration, and at first sight might seem in-

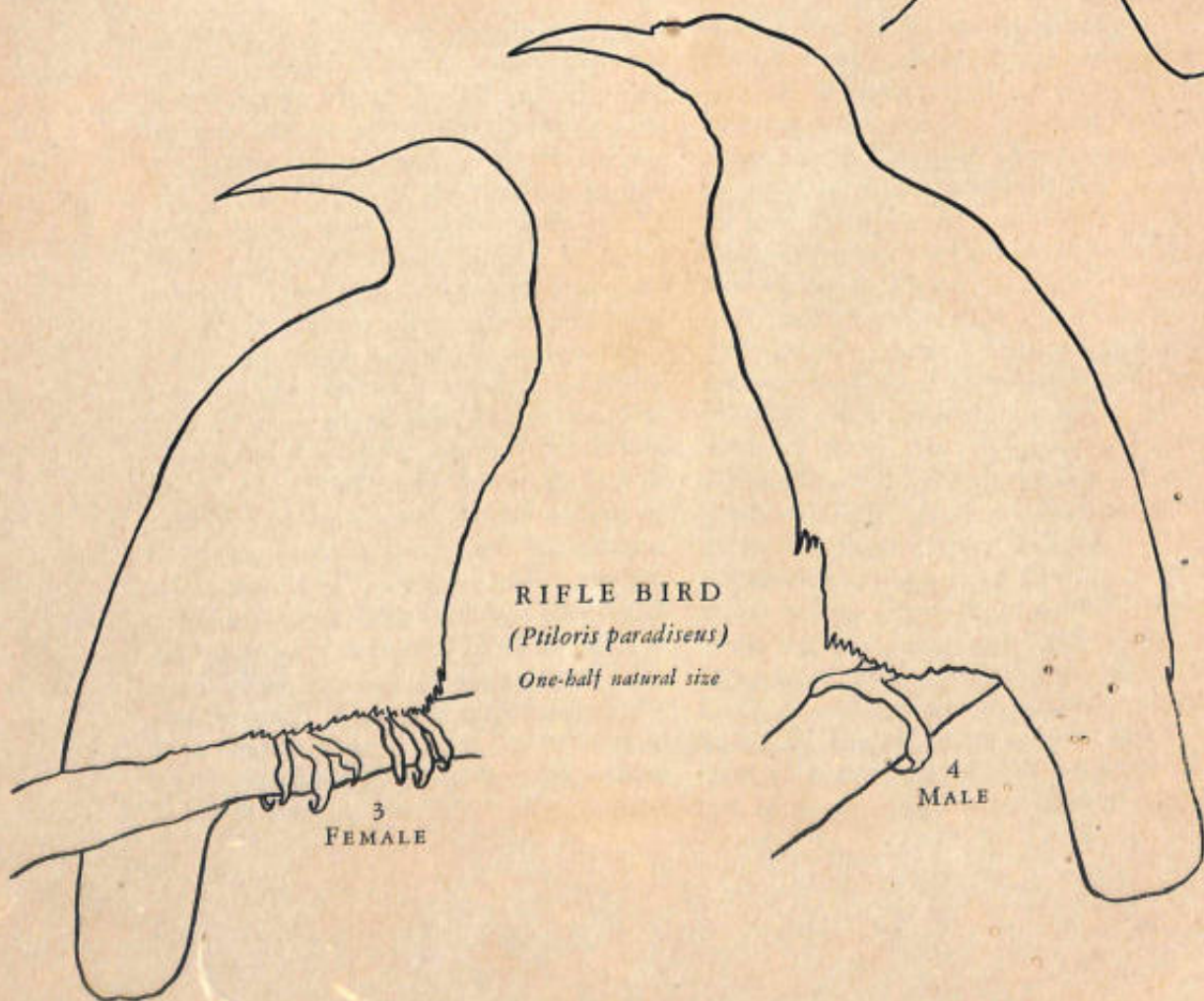
congruous, but the female is so similar that it requires close examination to separate it from the female of the Magnificent Rifle Bird. In this group, however, there can never be any dogmatic assertion of the closeness of relationship from either similarity in colour pattern or structure of feminine coloration. Thus it seems obvious that the two Australian Rifle Birds are very closely related, yet the females show more colour change on the under-surface than between the southern Rifle Bird and the Magnificent. Hence the great similarity in the female coloration of the Magnificent, and that of the Twelve-wired must be judged with caution. But there seems little doubt that there is a distant relationship.

THE QUEEN VICTORIA RIFLE BIRD

Plate I, Figs. 1 and 2

One of the earliest of the many Birds of Paradise to be named after royalties, this one may retain the name on account of its familiarity. Nearly one hundred years ago it was dedicated to the great Queen, and loyally it has never been renamed. This is an amazing form, as it intervenes between the New Guinea bird and the more southern Australian species, and shows distinct features unlike either. First it is smaller with a shorter, stouter bill, and though the male is generally similar to the latter, the feathers of the abdomen and flanks are broader, with brighter, broader, green ends, which almost entirely conceal the black bases. The female is much more different, in that it is greyer above, with the head shaft streaks duller, eye-stripe smaller; but the under-surface is rufous instead of fawn, and the markings are much smaller, only showing as sparse spotting on the breast and small V's and bars on the abdomen and flanks. This species was first discovered by Macgillivray, who recorded: "This bird was

seen by us during the survey of the N.E. Coast of Australia on the Barnard Isles, and on the adjacent shores of the mainland at Rockingham Bay, in the immediate vicinity of Kennedy's first camp. On one of the Barnard Isles (No. III in lat. 17° 43' S.), which is covered with dense brush, I found Queen Victoria's Rifle Bird in considerable abundance. Females and young males were common, but rather shy; however, by sitting down and quietly watching in some favourite locality, one or more would soon alight on a limb or branch, run along it with great celerity, stop abruptly every now and then to thrust its beak under the loose bark in search of insects, and then fly as suddenly as it had arrived. Occasionally I have seen one anxiously watching me from behind a branch, its head and neck only being visible. At this time (June) the young males were very pugnacious, and upon one occasion three of them were so intent upon their quarrel that they allowed me to approach sufficiently near to kill them all





LILIAN MEDIANO

with a single charge of dust shot. The adult males were comparatively rare, always solitary, and very shy. I never saw them upon the trees, but only in the thick bushes and masses of climbing plants beneath them; on detecting the vicinity of man they immediately shuffled off among the branches towards the opposite side of the thicket, and flew off for a short distance. I did not observe them to utter any call or cry; this, however, may have arisen from my attention not having been so directed to them as to the females and young males, which I was more anxious to procure, the very different style of their colouring having led me to believe that they were a new species of *Pomatosiomus* (Australian Babbler)."

Cairn and Grant collected many specimens in the Bellenden Ker Range, North Queensland, and Grant's notes read: "We found both sexes of Queen Victoria's Rifle-bird fairly distributed on the tablelands about the Upper Barron River, Lake Eacham and Boar Pocket. I have also shot females at Riverstone, on the flats along the Mulgrave River, about sixteen miles from Cairns. It is, however, on the tablelands, in the dense and luxuriant tropical vegetation, in which palms, ferns, orchid covered trees and vines flourish, that this lovely bird has its home. Each male seems to have a special haunt of its own, and when another of his own sex and species encroaches or trespasses on his domain they chase one another here and there through the foliage, but whether in sport or combat, I do not know. The male delights in swinging and fluttering on some rope-like vine extending across a creek, or hanging from tree to tree, especially in a spot where the sun's rays filter through the canopy of leaves overhead. He is extremely active when searching for food among the bark of trees, staghorn, bird nest, and other ferns, arboreal orchids, and other epiphytes. One can hear, in the

early morning, the harsh, rasping-like note uttered at intervals by this species; but being difficult to imitate, great caution must be used in approaching them. The flight of the male is short but rapid; sometimes when one is seated in the scrub the well-known rustle of the wings is heard as he flies quickly past. This noise, which resembles in sound the rustling of a lady's silk dress close by, is produced by the movement of the wing-feathers, and is confined to the males. One morning, when following a pebbly creek, I entered a small glade almost clear of trees, on the other side of which was part of a dead tree, almost denuded of its branches. On this tree I observed three or four birds, and from their strange and peculiar actions I concluded it was to me an unknown species. Trying to get within shooting range, I disturbed them, and they quickly darted into the scrub. Early next morning, under cover of the scrub, I approached the tree from the opposite side, and managed to get close to it unobserved. Peering through the foliage, I was delighted to find the birds on the same branch as I saw them the previous day, and having a good view of them, soon discovered they were Queen Victoria's Rifle-birds; one a fully plumaged adult male, the others females or young males, and evidently a pair of adults accompanied by their young. The brilliantly-plumaged male was spreading his wings in such a manner that the primary feathers of each wing were brought close together right over his head; added to this there were the gorgeous metallic golden green-tipped plumes of his body spread out in circular form around his breast. The bill was pointed upwards, showing to advantage the resplendent green scale-like feathers of the throat, and giving the bird the appearance of a living jewel. All the time he was swaying his body backwards and forwards, and twisting and turning

his head with seeming delight. The other birds kept hopping around him with outspread wings, evidently taking great pleasure in his actions, and occasionally like him uttering their loud and somewhat discordant note. All the stomachs of the birds of this species we examined, contained insects, small fruits, berries and seeds."

Hislop, from the Bloomfield River, North Queensland, reported: "There are always a few about here, but they are more numerous about the beginning of July, remaining throughout the spring to breed, and departing again at the end of January. Usually they are met with in the scrubs, and I have often seen the females and young males running up the tree-trunks and branches in search of insects out in the open forest-lands, but never a fully-plumaged male. In fact I have never observed the adult males except in the breeding season. These birds live chiefly on insects and berries, but they often come into the garden and eat the paw-paws and granadillas off our trees and vines. The nest is composed of long twigs, vines, rootlets, and broad leaves, and very often a cast-off snakeskin is worked into the outer portion of it. They are usually built in a Screw Pine from five to fifteen feet from the ground. On one Screw Pine, I found the nests of three successive seasons, and a pair of birds are building there again this year. Two eggs are laid for a setting, and I believe two broods are sometimes reared in the breeding season, which commences early in September and continues until the middle of January. In one season I obtained three sets of eggs from the same pair of birds, robbing the nests as soon as each set was laid."

The Queen Victoria Rifle Bird, *Ptiloris victoriae*, is superficially a black bird as to the male, but a greyish bird with a reddish fawn under-surface spotted and V-marked with brown below. Compared with the original Rifle Bird, which succeeds and is

described in detail, this bird is much smaller with a shorter, stouter bill; the tip is a little decurved, and shows a posterior notch (which is obsolete in the larger bird), with a rough serration of the edges of the upper mandible; the feathers extended further on the nasal groove concealing the nostrils. The iridescent feathers on the top of the head are less scale-like and more oily green; the breast shield lower angles are more prolonged and the feathers are smaller, green colouring with scarcely any bluish tinge; the black cape is more marked, the middle tail feathers are also more greenish and nearly reach the length of the others; underneath the black breast band is broader and shows a purple tinge, while the abdomen feathers show broad silver green tipping, the black bases concealed, but the opposite is in the case of the lengthened flank feathers, where the black is more extensive and the pale tipping narrower. The bill and legs are black, and the eyes are dark brown. The measurements of the average male are: bill from nasal groove 30 mm., wing 135 mm., tail 85 mm., central tail feathers 7 mm. less, tarsus 33 mm.

The female is slightly smaller in all its measurements and differs in colour so that the head is ashy brown, the shafts paler, giving a streaked appearance, disappearing on the back, which is uniform grey; the tail feathers are greyish brown of even length, much narrower than those of the male, while the wing feathers are brown normal feathers with red edgings externally, and a pale red edging internally on the inner secondaries; there is a smaller superciliary streak over the eye, the cheeks brown with faint streaks, the chin fawn, the throat reddish fawn, the rest of the under-surface bright rufous with brown spots on the breast, which develop into distant V marks on the sides and into bands on the lengthened broad flank

feathers, undertail coverts barred; the under-surface of the tail greyish-brown, the under wing coverts rufous and the inner lining of the wing chestnut; bill almost black, legs dark brown, eyes dark brown. The immature are like the female in coloration, but the bill, legs and feathering easily indicate the youth of the bird.

This species has a very small range, being one of the features of what is known as the Cardwell district or the Bellenden Ker area. It is amazing to find this well-differentiated form intervening between the New Guinea Rifle Bird and the southern one, and it is difficult to suggest their course of development.

THE ORIGINAL RIFLE BIRD

Plate I, Figs. 3 and 4

As already noted, the bird for which the name Rifle Bird was introduced is an Australian bird, and furthermore, has the most southern habitat of any of the so-called Paradise-birds. It differs from the original Birds of Paradise in its all-black coloration and its lack of feathery plume ornaments either on the sides of the breast or flanks. It will have been seen that some of the earliest specimens were called Velvet Birds, and that is a good selection, as undoubtedly the soft, lustrous black plumage recalls velvet. The crown has shimmering metallic-like iridescent feathering, while there is also a breast plate of similar feather structure. Two other important features must be pointed out, the peculiar wing feathers, as also those of the tail. It may be better to notice the female first, and then the great contrast of feather development in the male will emphasise itself.

The female is about the size of a Thrush, greyish-brown above, wings and tail brown, wing edges tinged with rufous, the head darker brown, the mid shafts of the feathers yellowish white, a whitish streak above the eyes, throat yellowish white, rest of under-surface pale fawn, each feather marked with a brown, broad V; flank feathers loose and broad-tipped, a little disintegrated and cross-barré; colours as before. All the feathers are nor-

mally formed, those of the wing being pointed at their tips and not very broad, the secondaries shorter and broader with broad, rounded tips as in many other birds; the tail feathers are also normal medium feathers.

The male as above is all black, but the feathers are soft and velvety; the wing feathers have changed in form, the first two curved, sickle-shaped, the first one narrow, the second broader, tips pointed, the others broader with broad ends, getting broader inwards, the secondaries very broad with rounded ends; the tail feathers also very broad, round-ended, the two middle shorter, iridescent; feathers of the abdomen broad with loose, greenish tips shining and flank feathers very broad and not elongated.

Strange's note gives an excellent idea of the real naturalist's work: "The principal resort of the Rifle Bird is among the large cedar-brushes that skirt the mountains and creeks of the Manning, Hastings, Macleay, Bellenger, Clarence and Richmond Rivers, and there, during the pairing months of November and December, the male bird is easily found. At that time of the year, as soon as the sun's rays gild the tops of the trees, up goes the Rifle Bird from the thickets below to the higher branches of the pines (*Araucaria macleayana*) which there abound. It always

affects a situation where three or four of these trees occur about two hundred yards apart, and there the morning is spent in short flights from tree to tree, in sunning and preening its feathers, and in uttering its song each time it leaves one tree for another. The sound emitted resembles a prolonged utterance of the word 'Jass,' by which the bird is known to the natives of the Richmond River. In passing from tree to tree, it also makes an extraordinary noise resembling the shaking of a piece of new, stiff silk. After 10 a.m. it descends lower down, and then mostly resorts to the thick limb of a Cedar tree (*Cedrela australis*), and there continues to utter its cry of 'Jass' at intervals of two minutes' duration; at this time, owing to the thickness of the limb and the closeness with which the bird keeps to it, it is very difficult of detection; wait with patience, however, and you will soon see him, with wings extended, and his head thrown on his back, whirling round and round, first one way and then another." This is apparently the first note of the display.

The scientific history of the Rifle Bird begins when Swainson recognised it as a new genus and named it *Ptiloris*, giving as specific name *paradiseus*. The bird is of medium size, with a long, curved bill, medium-rounded wings, short, square tail, short, stout legs, and large feet. The male is wholly black, with no plume ornamentation, but the entire plumage is velvety, the top of the head and a breast shield composed of glittering, scale-like feathers. The female has no ornamentation or iridescent feathering, but is greyish-brown above, fawn below, with irregular cross-bar markings. The details of structure are: The bill is long and curved, longer than the head, strongly laterally compressed, with very slight basal expansion, comparatively deep, culmen ridge round, a little flattened above nasal groove, which is short and almost completely filled with

feathering, approaching from the forehead; the nostrils short and linear, barely free of the feathering, the interramal space small, shallow, feathered, gonys very long and slightly curved. The wing is rounded, the first primary narrow, a little more than half the length of the fourth, which is slightly the longest; the first is slightly curved, with the apex a little attenuated, the second broader, curved, pointed, nearly reaching the third, which is broader and roundly tipped, as are the succeeding ones, the fourth very little longer than the third, the fifth shorter than the third, the remaining primaries decreasing very little regularly to the even broader secondaries, which get broader inwards without growing much shorter. The tail is rather short, composed of twelve broad, almost square-ended feathers forming an almost straight tail, save that the central pair are a little shorter, round-topped and brightly metallic iridescent, the other ten being velvety black. The legs are short, stout, the front showing strong, broad scutes, the sides and back showing rounded scaling, save for a smooth plate posteriorly. The frontal toes are strong but short, the claws rather large and rounded, the middle toe longer than the outer, which is longer than the inner; the hind about as long as the hind toe, but stouter, the claw stronger and longer.

The species *Ptiloris paradiseus*, the original Rifle Bird, will now be described as to its coloration in detail. The bill is black in the male, the frontal feathers which grow on the nostril lid are velvety black, the feathers of the top and back of the head small, scale-like, closely rucked and shining with a metallic sheen of emerald to bluish green, a purple tinge showing on the back of the head; the sides of the head show a bronze tinge; the back, rump and upper tail coverts are velvety black

with a very slight brown tinge, the feathers of the upper back longer as if they might form a cape; the wing feathers are blackish brown, the secondaries blacker tinged with purple; the tail feathers black, the central pair only shining metallic bluish green; underneath the chin feathers are very small and velvety black, but the throat and upper breast feathers show an elongate triangle of rather long, narrow, scale-like feathers of a blue green iridescence, the lower angles extending a little sideways, which is called the breast shield; the sides of the breast and a broad band across the lower breast are deep velvety black; succeeding this band the feathers broaden, and show an edging of silvery green which grows more extensive, concealing entirely the velvet black bases; lower, the feathers also lengthen, but remain broad and dense; the under wings and tail are black. The legs are also black, while the eye is dark brown; in the pulled out skins a large aural aperture is often seen, but this has not been studied as in the Owls. The length of the bill, taking the chord from the nasal groove to the tip, is 40 mm., the wing is 155 mm., the tail is 108 mm., the middle pair 10 mm. less, the tarsus is 35 mm. This is an average typical bird such as is here figured.

The female has the bill more brownish with a basal paleness, and the feathering being normal a few rictal bristles may be seen; the head feathers are brown with whitish shaft streaks, becoming obsolete on the nape and missing on the back feathers, which are paler brown glossed with grey, persisting on the rump and lacking on the short upper tail coverts, while the tail feathers are brown with a slight reddish tinge; the tail feathers are narrower than those of the male, and all of an equal length and a little shorter. The wing feathers are also normal, the

feathers narrower, though the secondaries are broad and the proportions very similar; the feathers are brown, the outer edges showing a distinct reddish sheen; from the lores over the eye extending to the nape is a band of pale fawn feathers, the feathers of the cheek are similar to those of the crown but smaller, a whitish band also extends from the base of the lower mandible to the end of the jaw, enclosing a pale fawn chin and becoming specked with brown on the sides and lower throat, where a brown, squarish V-marking begins, the broad tips remaining fawn; this continues down the under-surface, the V's spreading out so that on the lengthened lower flank feathers they become practically irregular bars, as are also seen on the under tail coverts; the under tail is brown, but the under wing differs; the inner lining of the primaries and secondaries being clear chestnut red; the small inner wing coverts are reddish fawn with small dark brown markings; the legs are brownish black and the eye is dark brown. The measurements of the female are slightly smaller throughout.

The immature birds resemble in coloration the female bird, but can be easily differentiated by their juvenal characters.

The distribution of this bird is restricted to Northern New South Wales and Southern Queensland, a zoological area with many local characteristics, so that it has been separated as the Oxleyan Sub-Area. In consequence of the small range, there is little geographical differentiation, the southernmost birds being typical, and a northern form from the Bunya Bunya Mountains, Blackall Ranges, South Queensland, has been separated as being slightly smaller, with the feathers of the breast-shield more pointed and of a richer green. The far north Queensland representative differs so widely that it has been commonly regarded as specifically distinct

THE MAGNIFICENT RIFLE BIRD

Plate II, Figs. 1 and 2

The early history of this bird has been noted above, and again the female is very like that of the southern Rifle Bird, but the upper-surface is more rufous and the head is unstreaked, while the under-surface is more closely narrowly barred throughout. The male is very similar on the upper-surface, but has a more brilliant, larger breast shield, and the feathers of the abdomen are more normal, tending to disintegrate, while there is a large bunch of disintegrated long flank plumes extending beyond the tail. The breast plate is separated from the lower breast by a distinct line of coloured feathers, of which there is no trace in either of the two preceding. D'Albertis reported that this Rifle Bird is very shy, and it is impossible to track it in the forest; but by imitating its cry, which consists of three distinct notes—oooih, oooih, oooih—it may be brought within range of its pursuer, for the bird, overcome with curiosity to find out who is daring to try and charm his female, comes at last to the outside of the trees, craning his neck in all directions on the look-out for the intruder, when, of course, he pays the penalty for his curiosity and jealousy. The food consists of seeds and fruits as well as insects.

Hunstein, writing of the south-eastern form: "Has a different call from the Australian Rifle Bird. It calls on two notes, one deeper than the other, similar to that of the Raven. The bird is shy and difficult to get at; it resorts mostly to the Ranges, and frequents trees with plenty of vines and creepers on them."

This was confirmed by Goodwin: "We met with this Rifle Bird on Mount Kowald and Mount Belford in the Owen Stanley Range, at an altitude of from 2,000 to 3,000 feet. It haunts the denser scrubs, generally near a running stream, and is

solitary in its habits, wild and shy, requiring no little skill in acquiring a specimen."

When this species was first discovered in Australia by Macgillivray, he noted: "This fine Rifle-bird inhabits the densest of the brushes in the neighbourhood of Cape York. The natives are familiar with it under the name of 'Jagoonya'; the Darnley Islanders also recognised a skin shown them, and described it to be a native of Dowde, on the south coast of New Guinea, near Bristow Island. Its cry is very striking; upon being imitated by man, which may be easily done, the male bird will answer; it consists of a loud whistle resembling 'wheoo' repeated three times and ending abruptly in a note like 'who-o-o.' Both sexes utter the same note, but that of the male is much the loudest. The old males were generally seen about the tops of the highest trees, where, if undisturbed, they would remain long enough to utter their loud cry two or three times at intervals of from two to five minutes. If a female be near, the male frequently perches on a conspicuous dead twig in a crouching attitude, rapidly opening and closing his wings, the feathers of which by their peculiar form and texture produce a loud rustling noise, which in the comparative stillness of these solitudes may be heard at a distance of a hundred yards, and may be faintly imitated by moving the feathers of a dried skin. The full-plumaged males are much more shy than the females or immature birds. According to the testimony of several of the Cape York natives whom I questioned upon the subject, the *C. magnifica* breeds in a hollow tree and lays several white eggs. The ovary of a female shot in November, the commencement of the rainy season, contained a very large and nearly completely formed egg.

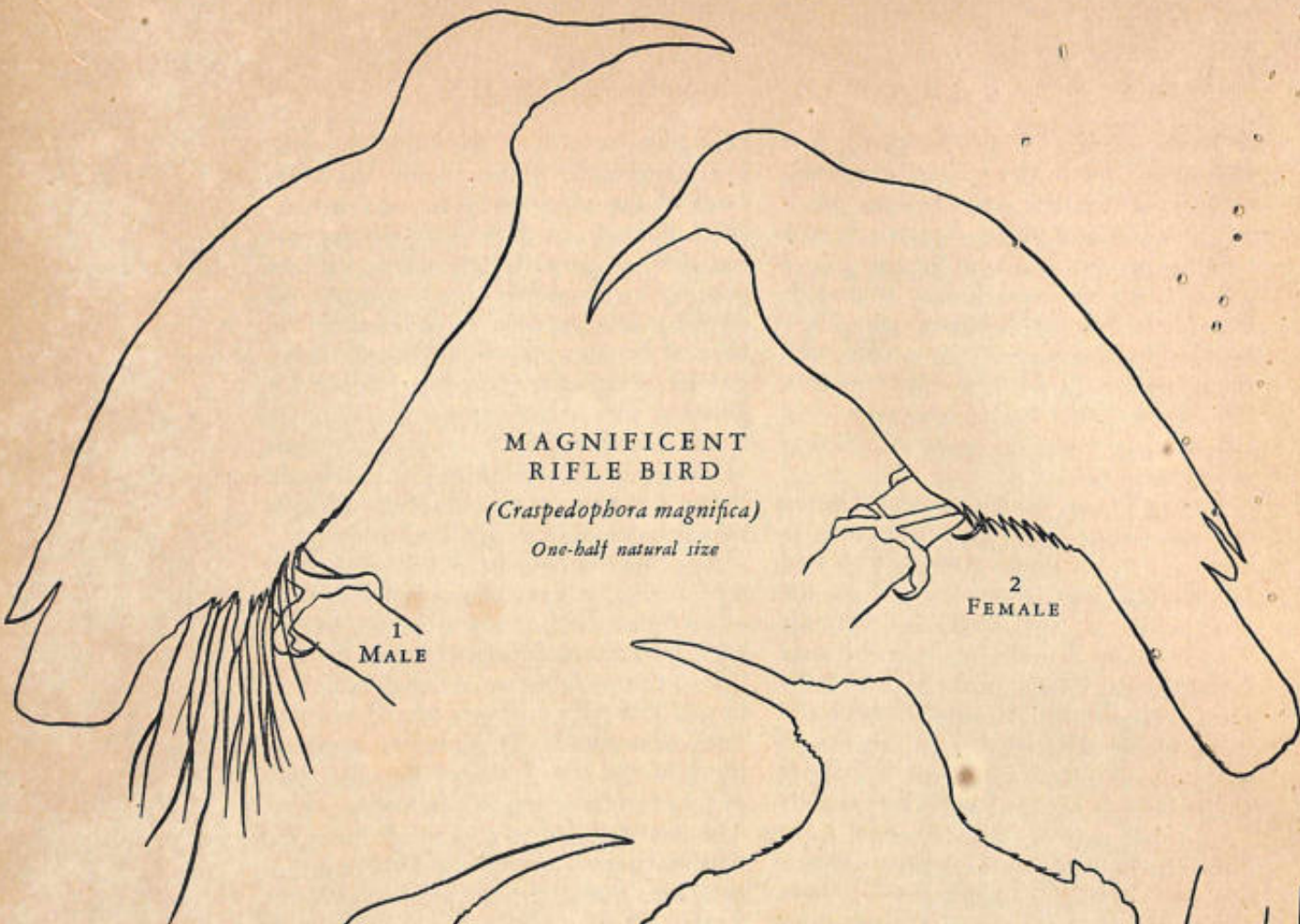
From the shyness of this Rifle-bird, it is difficult to catch more than a passing glimpse of it in the dense brushes which it inhabits; I once, however, saw a female running up the trunk of a tree like a creeper, and its stomach was afterwards found to be filled with insects only, chiefly ants; while the stomach of a male, shot about the same time, contained merely a few small, round berries, the fruit of a tall tree, the botanical name of which is unknown to me."

Thorpe's notes are interesting: "During my stay on the Cape York Peninsula, in 1867-8, I found Prince Albert's Rifle-bird frequenting the dense brushes in the neighbourhood of Somerset, opposite Albany Island. I never saw it in the open forest country inland, or even crossing the grassy belts which intersect the brushes in many places. The females, which are by no means shy, were often met with close to the settlement, but I never shot a fully adult male within two miles of Cape York. Each male has a certain haunt of his own, averaging about two or three hundred yards in diameter. It utters three loud, rich notes and finishes off with a fourth much deeper in tone. At frequent intervals they call as a sort of a challenge to each other; but when they trespass on one another's domain, and meet, they have a pitched battle. The males are very wary, and it is almost impossible to stalk them, but being of a jealous nature they will come readily on imitating their call within or near their haunts, usually approaching in an excited manner, the peculiar noise made by their wings being distinctly heard as they come within range. I have an idea that they are polygamous, as the few I have been able to stalk, when they would not respond to my answering call, I found were accompanied or surrounded by several females. On one occasion I heard a male calling frequently, and finding my notes in answer would not allure

him, I managed after some time to carefully approach within about thirty-five yards of the place where he was calling. From there I could see him running up and down a partially fallen tree, held in position by some vines, and so intent on showing off his beauty to an admiring bevy of females that he did not heed my coming. After watching for a while his graceful and sometimes grotesque movements I fired, and he fell; several females at the same time darting into the scrub. When I went to pick the bird up, I found two females dead beside him."

The Magnificent Rifle Bird has been separated as a distinct genus on account of its ornamental variation in conjunction with other minor details, the name selected being *Craspedophora*. At sight it is a larger bird with a longer curved bill and long filamentous flank-plumes recalling those of the true Birds of Paradise, but, of course, black, not red, yellow or white. The breast shield is also much more extensive laterally as well as running up to the chin, thus apparently leading to the Superb Birds, while the flank plumes differ entirely.

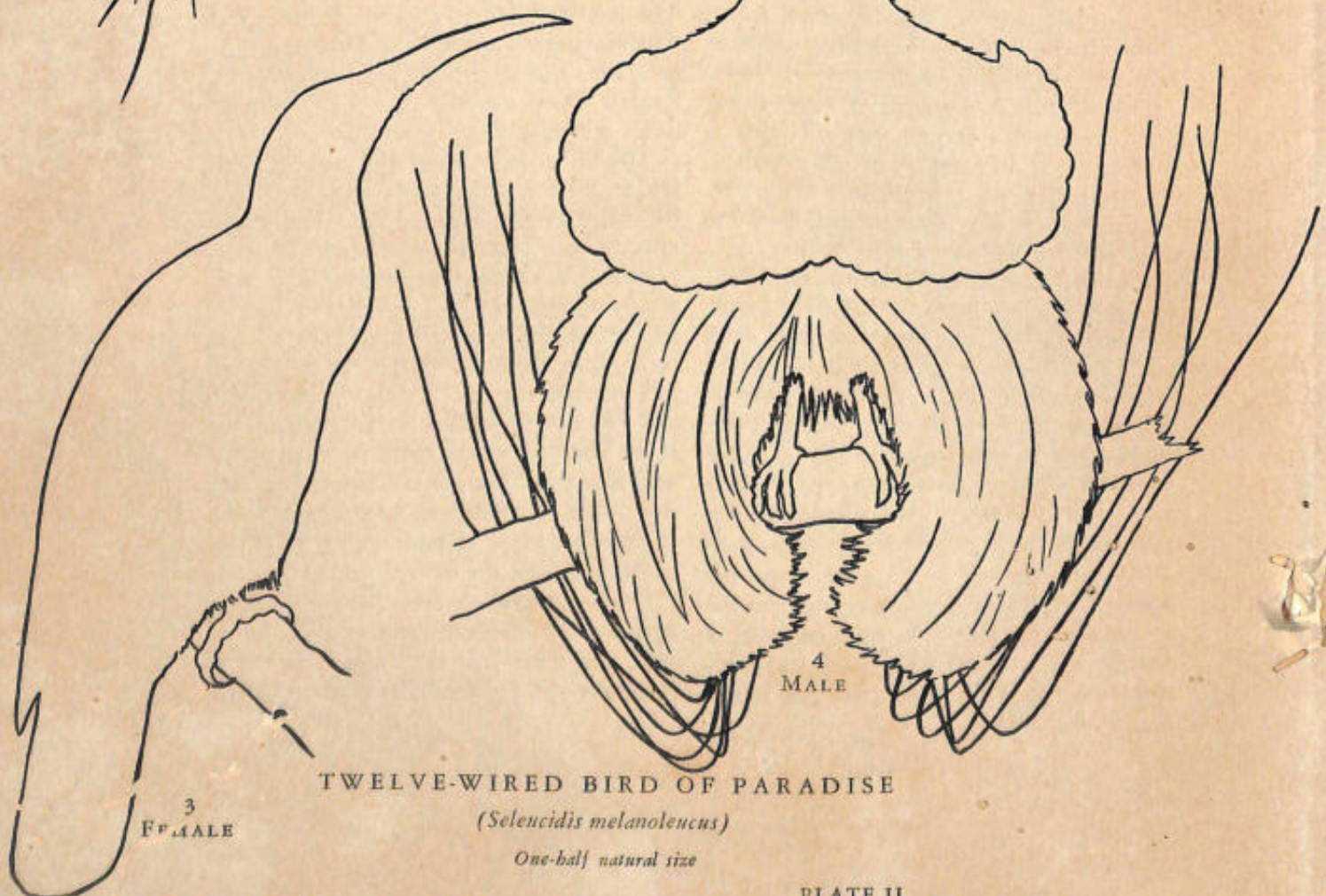
The bill is long, stout and curved, similar to those of the preceding in detail, the nasal groove covered with feathering approaching from the forehead and completely concealing the nostrils. A moulting bird, however, has shed the frontal feathers and the nostril is seen as a long, open, linear slit showing a notable internal process; the tip of the culmen is well decurved, sharp, and posterior notch easily seen. The interramal space is rather small and feathered, the gonys long and curved. The wing is similar in structure to those of the preceding, while the tail is short and square, but the central pair of feathers is scarcely any shorter than the other feathers. The breast shield is more extensive, composed of small feathers which narrowly run right up the chin to the in-



MAGNIFICENT
RIFLE BIRD
(*Craspedophora magnifica*)
One-half natural size

1
MALE

2
FEMALE



TWELVE-WIRED BIRD OF PARADISE
(*Seleucidis melanoleucus*)
One-half natural size

3
FEMALE

4
MALE



Lilian MEDLAND

terramal area, broadening more on the upper breast, and separated from the abdomen feathering by two narrow bands of non-shining feathers. The feathers of the abdomen are all indistinct with disintegrating tips, quite unlike the well-marked, broad-tipped feathers of the Australian Rifle Birds, and these develop on the flanks into long plumes with bare shafts and distant webs. The legs are strong and the feet stout, as in the other Rifle Birds.

The coloration of the male *Craspedophora magnifica* is generally all black; the crown and nape feathers are small and metallic, iridescent bright green on the crown, but with a strong bluish sheen on the nape; the back velvety black with dull purple sheen; the wings black with blue sheen on outer edges; tail with two central feathers shining metallic bluish green, the remainder velvety black; the large triangulate breast shield iridescent metallic blue green with purplish reflections at the sides, the lower margin bordered with a narrow band of velvety black succeeded by a line of coppery green, the lower breast and abdomen brownish black with a slight purplish tinge, all feathers with long disintegrated tips which lengthen on the sides into long black flank plumes. The bill and legs black, eye dark brown. Total length 304 mm., bill 53 mm., wing 172 mm., tail 108 mm., tarsus 43 mm. The female is only a slightly smaller bird, measuring bill 51 mm., wing 164 mm., tail 106 mm., tarsus 42 mm., but the coloration is very different, the head and back greyish brown, the shafts of the head feathers pale, but not so marked as in the previous species, the edges of the wing with reddish margins; the tail feathers narrow and pointed with pale reddish edges; there is a broad white band over the eye; the cheeks and throat fawnish white with a malar stripe of brown; the rest of the under-surface fawnish white, closely cross-

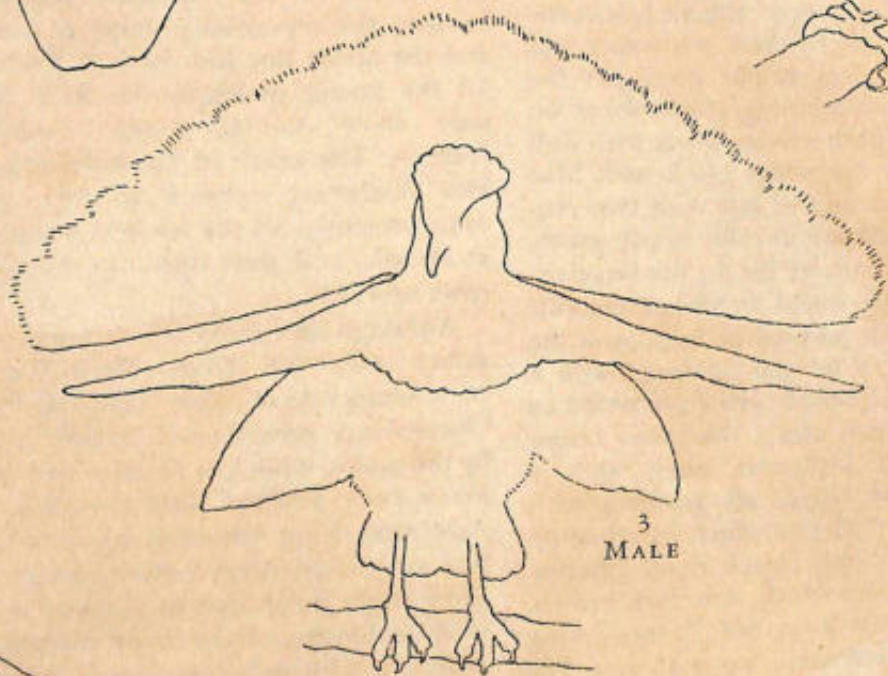
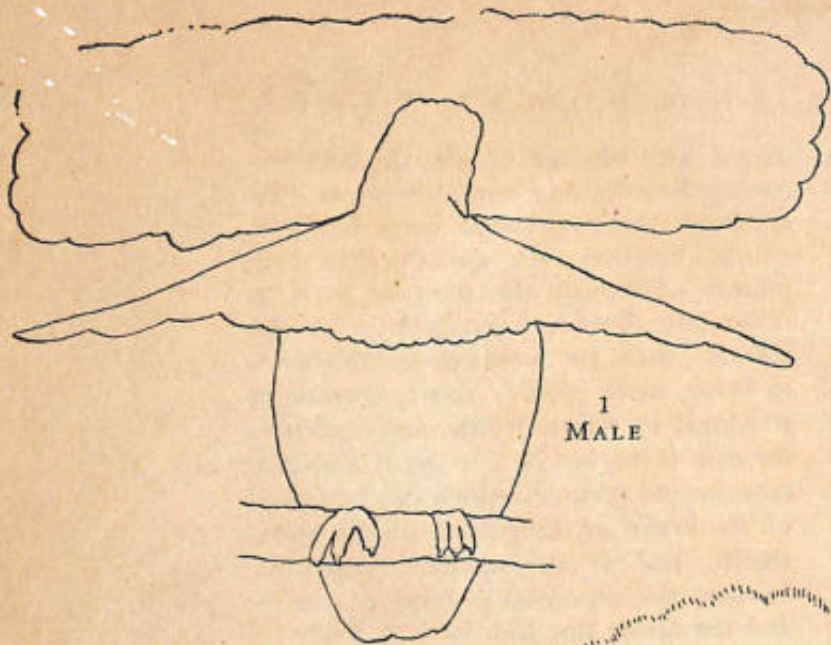
barred with blackish brown, the bars becoming broader and more distant as they approach the lengthened flank feathers, which, however, do not develop into plumes. Although the juvenile male is commonly dismissed as "similar to the female," there are many minor differences, as being more reddish above, sometimes strikingly so, whiter below, and especially the chin is marked by a stripe of minutely cross-banded feathers, which can be traced on the breast as the pattern of the breast shield, and is an excellent diagnostic feature; the superciliary stripe is smaller and the malar line less marked. Probably all the young males in the Rifle Birds may show similar minor diagnostic features. The moult of the metallic scale-like feathering appears to take place simultaneously, all the feathers being seen in sheath, and then open up quickly in rows upwards.

Although the range of this species is rather extensive from North-Western New Guinea to the East Cape and North Queensland, subspeciation is little shown by the males, while the females and young males have received little attention. The Australian form was early separated, and just as quickly merged again, but it does show slight distinction in size and a little in the colouring of the breast margin; the female is whitish below, closely barred as described above, whereas the western New Guinea bird is more fawn and the barring broad and further apart. The eastern New Guinea bird was separated as *intercedens*, with a shorter, heavier bill and more purplish on the lower breast and abdomen; this was found unsatisfactory, but it was noted that there was a slight difference in the feathering at the base of the culmen, the female being regarded as paler above than the Western form, but very like the Australian form. Rand recorded a series from Bernhard

LESSER SUPERB BIRD OF PARADISE

(*Lophorina superba minor*)

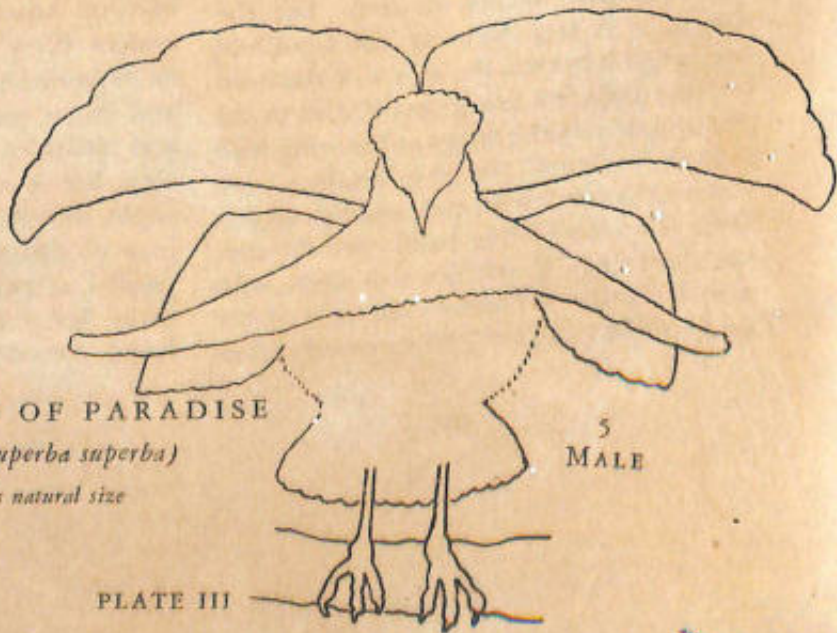
Two-fifths natural size

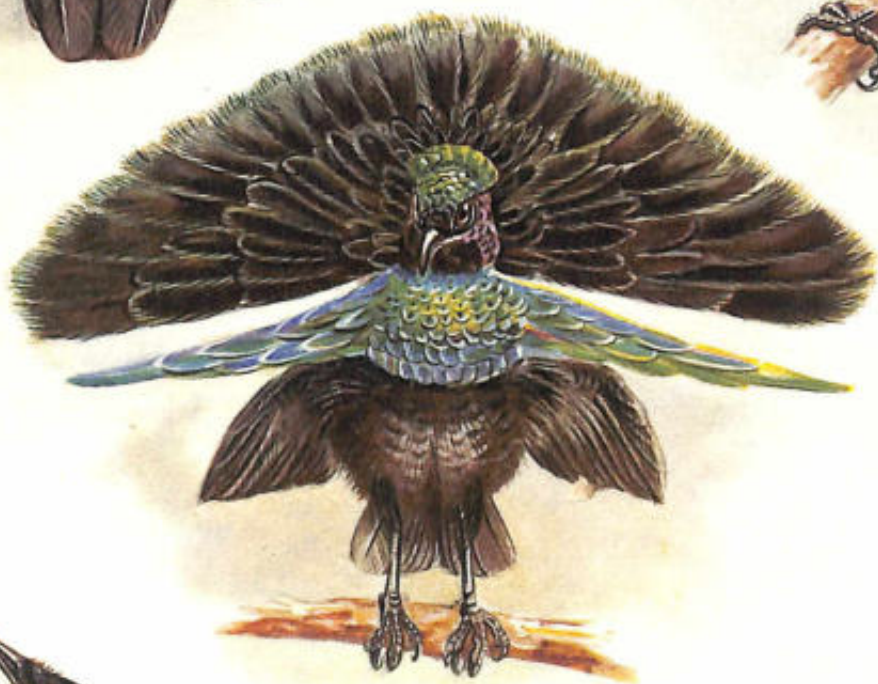


SUPERB BIRD OF PARADISE

(*Lophorina superba superba*)

Two-fifths natural size





Lilias Merula

Camp, Cyclops Mts. and Hollandia on the North Coast as referable to the typical form without comment, giving measurements of wing in males 181-196 mm., one female 153 mm. Mathews separated the

bird from the Claudia River, North Queensland, as *C. m. claudia*, having the throat and upper breast greener, with the feathers rounder, not so pointed. It is also smaller, wing 173 mm.

THE SUPERB BIRDS

Plate III, Figs. 1 to 5

This and the succeeding were lumped together by Valentyn as "The Black Paradise-birds. The larger variety of these is sold by the natives without wings and feet; and therefore is very difficult to be described with accuracy. The remains are generally stretched out on a stick to the length of four spans. The feathers of the head, neck and belly are black, silky, and mixed with a radiant hue of purple and gold. Beak blackish, an inch long. From both sides spring bunches of feathers, somewhat similar to quill-feathers, but in reality very different from them, for this species is always offered for sale with the wings cut off. The feathers in these bunches are extremely soft, with broad webs like peacock's feathers, of a fine shining green, and all reverted (whence Valentyn suspects that they become reverted in the bamboo joints in which they are enclosed by the natives). Tail wedge-shaped; tail feathers next the abdomen, hairy; upper ones, longer and pointed; those immediately beneath these, above a span and a half in length, stiff, with loose, doubly compound rays, black above, shining below. The birds of this variety are brought only from the part of New Guinea called Serghile. The inhabitants carry the skins dried upon sticks by smoke, and enclosed in bamboo joints, to the island Salawat, and exchange them for hatchets and coarse cloths. The Papuans call them Shagawa, and also Paradise-birds from Serghile; in Ternate and Tidore, they are called Soffu-kokotu, Black Paradise-birds. Serghile is the most northern part of New Guinea, running out

to a sharp promontory, situated beyond or to the east of Gilolo and the Papua island, and facing the north.

"Besides the greater black Paradise-bird, there is a lesser variety. Its feathers are equally long, but not so thick; black above, not shining. This variety is also destitute of the shining peacock feathers found in the first. It likewise wants the three long pointed tail feathers, which are proper to the greater kind. The Alfuhris, or inhabitants of the mountainous part of the isle of Messowal, shoot these birds with arrows, and sell them to the people of Tidore."

These descriptions lack the essential of these two interesting birds, so Sonnerat may be referred to, as he gave life-like representations from nature, his excellent figures showing everything, legs, feet, wings and ornaments. He called one the Bird of Paradise, with the violet throat, surnamed the Superb, and figured it sitting on a branch clutching a small dead bird in one foot. The description is full and excellent. The other one Sonnerat called the Bird of Paradise with the golden throat, but the curious six feathers, three from each side of the head, secured for it the scientific name *sexpennis*, which has been colloquially corrupted to Sixpenny. The figure and description are both again excellent, and with these before the student there never was any excuse for confusion. Apparently, however, this book was unknown to D'Albertis, as when he sent notes home regarding the Superb, he wrote: "This bird like the preceding (*Parotia sexpen-*

nis) is very little known except from imperfect specimens. It is found in the same mountains (Arfak) as the last-named species and feeds upon similar fruits. It flies from branch to branch in the forests, uttering a cry of 'Nied-nied', and from this peculiar note is named by the natives 'Niedda'. The muscles used in the elevation of the crest of *P. sexpennis* are surprising, but are surpassed in size by those of this bird; for with them it can extend, contract, elevate, and depress the long velvety feathers which, commencing a little below the occiput, extend along the body like a mantle; and when these are elevated the two feathers, horns, or tufts at the root of the beak are raised at the same time."

The Superb Bird was given a genus *Lophorina*, very early in the study of these birds, with very good reason, judging from the male bird alone. The birds are rather small with a longish, straight bill, rather long tail, medium wings and shortish legs, but medium feet. The male is black adorned with nasal tufts, chin tuft, metallic, scaly iridescent head, enormous nape frill and large breast plate with extensive prolongation laterally.

The bill is longish, straight, laterally strongly compressed, culmen arched, semi-keeled, tip a little depressed, sharp, posteriorly notched, nasal groove small, nostrils linear, operculate, a feathery tuft arising from the operculum on each side, interramal space small, gonys semi-keeled, straight, a chin tuft developing from the interramal space and chin. The nasal erectile tufts are velvety, not metallic, as are the closely appressed feathers which adorn the head and nape; from the nape arises a magnificent nape frill of velvety feathers which may extend from tip to tip laterally over nine inches, more than the normal length of the bird itself. This is offset by a magnificent breast shield which, perhaps beginning as a triangle with small

angular prolongation, has now achieved great proportions, reaching laterally to an extent of over seven inches. The wing is fairly long, with the primaries narrow and normal, the first short, narrow, and attenuated apically, the second narrowed and pointed, the secondaries broad; the second is a little shorter than the third, which is about equalled by the seventh; the fourth, fifth and sixth a little longer, sub-equal and forming the tip. The tail is long and squarish, but the central pair slightly longer than the others. The leg is not very long, outer surface smooth, and back bilaminar, but a few scales are seen anteriorly, while scutes may be seen obscurely in front. The front toes are delicate, rather short, claws long, mid toe longest, outer a little longer than inner, hind toe long and stout, almost as long as mid toe, claw longer, so that hind toe and claw exceed in length the middle toe and claw.

The description of the typical species, *superba*, here follows as to coloration. The colour of the metallic feathers of the crown and nape is a glittering bluish-green, the nasal tufts and the chin tuft velvety black; from the nape extends a huge frill of velvety black feathers of various forms, all round broad-ended with the tips disintegrated, this tip measuring only from 3 to 5 mm., the outer feathers longest and the median series shortest; the feathers of the back are brownish black, somewhat loose and disintegrating, but showing none of the bronze sheen seen on the nape frill. The wing feathers dark brown, the secondaries darker. The tail feathers blackish brown, the central pair slightly longer and deep velvet black. Underneath the lower chin is bronzy black, then succeeds an extensive breast shield composed of deep oaty green feathers, the uppermost small and rounded, getting larger and lengthened towards the side where the outermost are greatly elongated and narrow with square

ends; the remainder of the under-surface dull black, the feathers of the flanks a little lengthened and disintegrating. Under wing and under tail sombre brown and blackish brown respectively. The bill from nasal groove to tip 19 mm., wing 139 mm., tail 100 mm., tarsus 30 mm. This description is drawn up from a specimen from Arfak, and it has to be mentioned that the small feathers of the breast shield show a black median streak as marked as in the type of *L. minor*, although in every report since Finsch and Meyer this streak is stated to be characteristic of *minor* and missing in the typical *superba*. The female accompanying the above male has the top of the head, nape lores and cheeks soft, black, silky feathers with a slight purplish tinge, with a line of small white dots behind top of eye; nasal feathering short; interramal feathering short, hair-like, black, white-tipped, throat black with white disintegrated tips; upper-surface dark olive brown with a reddish tinge (chocolate), the red noticeable on the edges of the brown wings and tail; under-surface brownish white with subterminal dark brown bars giving the under-surface a closely barred appearance. Measurements: bill as above 18 mm., wing 135 mm., tail 110 mm., tarsus 30 mm. Note that the tail is longer, though other measurements are smaller.

The variation seen in the males is not easily recognised, as when the first variation was indicated, only size was noted, but the difference in the females was very appreciable. There was little difficulty in accepting these distinctions, as the forms were separated by the whole length of New Guinea, but since then some half-dozen more races have been named, and though the validity of the races is not in question, they are of little practical value to the average bird student, and are only of interest to the practised systematist. These geographical varieties are of some

value in critical work in determining areas of distribution, but it will be some years before anything becomes really worthwhile in this direction. The merest tyro in the investigation of bird life in New Guinea meets with many anomalies which contradict one another, inasmuch as the time factor is commonly ignored, and only the place factor taken into consideration. Thus in this genus the birds are restricted to New Guinea proper, not even inhabiting either the Western or Eastern Papuan Islands, yet reaching near the coast line in each direction, apparently with an altitudinal range of from 3,000 to 7,000 feet. The males have reached a maximum of development in that they have achieved uniformity in black coloration and in their peculiar style of adornment. Yet the females retain their low-class plumage with little attempt at improvement. Moreover, in each case the variation throughout the extensive range is comparatively slight, so that the geographical races are not easily distinguished. Some of these have been based on the plumage of the female without sufficient material to fix the constancy of the variation, while errors have been perpetuated without criticism. Thus, since the introduction of the eastern form, this has been said to have the feathers of the breast shield with black centres, while the typical Arfak form was supposed to show no black centres to the breast shield. Examination of an Arfak specimen denies this distinction, as it shows the black centres as markedly as does *minor*. One hundred years after the knowledge of the North-Western New Guinea bird, a similar smaller bird was discovered in the South-East and this was called *minor*. The difference in size is not very noticeable, so that when Meyer received a female he developed the distinctions in that sex, remarking: "The principal difference in the males is in the black central streak of the central feathers

of the breast as Ramsay did not allude to this particular (because it did not occur in the specimen from Arfak as above); nasal plumes are shorter, the chin plumes longer; the metallic nape is violet tinged, the bird is smaller, and the outer feathers of the breast shield appear to be considerably longer. The female of *L. minor* has on each side a broad white-spotted superciliary stripe meeting behind; the lower surface is more yellowish and the back olive brown, lacking the reddish tinge; the inner webs of the wing feathers rusty instead of blackish brown." These were kept as separate species, and it is still doubtful as to their exact status, though recently all the forms have been regarded as subspecies. Twenty years later the bird was found in the Rawlinson Mountains, Huon Peninsula, and was distinguished as a subspecies of *minor* on account of "the long lateral plumes of the pectoral shield slightly longer and distinctly wider." This was followed by Ogilvie-Grant naming the Utaqua River form as somewhat larger than *L. minor*, and with the fringes to the long feathers of the cervical plumes generally wider. Wing 135-139 mm. as compared with 126-130 mm. in *L. minor*. But these are the measurements of *superba* from Arfak, considerably geographically closer than *minor* of the South-East. The female was also compared with *minor* though larger; wing 121-123 mm. as compared with *minor* 110-115 mm. The crown was stated to be brown like the back, instead of black as in *minor*, and the ground colour of the under parts from the throat downwards is rufous-buff instead of whitish. Then followed a series of subspecies, *niedda* Mayr from the Wandammen district (between the Utaqua and Arfak); *connectens* Mayr from the Herzog Mts. south of the Huon Peninsula; *sphinx* Neumann, a female described from unknown locality!! and then *pseudoparotia* Stresemann from the Hunsteinspitz, mid-

dle Sepik, at first identified as a female of the Six-plumed species!!! These were all admitted in the latest list without completing the toll, as Mayr had noted, a specimen from the Van Rees Mts., lower Mamberano, and apparently this bird varies in every distant locality. Rand also recorded a series from the lower northern slopes of Mt. Wilhelmina under the name *feminina*, a rather unlikely location.

As already remarked, the distinctions are slight and only of technical interest, but a feature seen in the perplexing males is that of the nape frill and also that of the breast shield.

Captain N. B. Blood secured a male in the Mt. Hagen district, and the nape frill is very extensive, with very broad disintegrated tips, while the breast shield is also very wide, the elongate feathers broad (*latipennis*), so that as spread out the nape frill measures 290 mm., the fringes varying from 5 to 10 mm.; the outspread breast shield measures 200 mm., longest feather 10 mm. broad. The nasal tufts are large, with the chin tufts long, cheeks bronze, throat black, the nape frill a beautifully bronze sheen, the breast shield oily green with a blue tinge, and in some lights quite purple. The bill from the nostril measures 18 mm., the wing 125 mm., the tail 88 mm., and the tarsus 34 mm. This is as distinct as any of the other subspecies, and therefore has been named *Lophorina superba addenda*. From its wing measurement it would belong to the *minor* group, but Mayr and Rand have measured a series of *minor* from Eafa as having the wings in the males from 124 mm. to 136 mm., mostly 130-132 mm., with the tail of 89 to 100 mm., the wings of the females 112-118 mm., with tail 115 mm.; also noting that the young male was like the female, but with longer wing; they did not mention the length of the tail, nor did they make any comments on the nape frill or breast shield.

THE SIX-PLUMED

Plates IV, V and XIII, Fig. 4

The outstanding feature of this group is the presence of six plumes from the sides of the head, three on each side, springing from just behind the ear; these plumes extend up to six inches behind as naked, wire-like shafts, a small feathered racket appearing at the end of each one. The plumes are capable of movement in almost every direction, even straight in front. Although the typical bird (male) was all black, with merely a white mark on the forehead, and wearing a series of side plumes, which are broad and capable of extension as a wide "umbrella", some kinds since found have the head variegated and the umbrella particoloured. The all black series will be mentioned first, as this shows variation in size, and a little in head coloration. The head is full-feathered with a nape band of narrow iridescent feathers and a curious frontal patch of white to golden feathers which may differ in form; all the rest of the upper and under-surface except a golden breast shield is velvety black. Thus the first impression is of the six plumes, but if these be missing the "umbrella" should be present, that is, if the bird be a black male. The female does not possess the "six plumes" nor the "umbrella", and is a drab bird quite different, having a blackish head, brown above and barred brown and pale fawn below. The different forms and species show rather differently coloured females, although of the general plan. It first appeared as one of the "Black Paradise-birds" in Valentyn's account as related above, and was well described and figured by Sonnerat, who seems to have had a complete bird to work from, at least dead, if not alive, as he

gives the colour of the eye, and fully discussed the drawing by M. Marvi of a similar bird said to be from Japan, and with the "ostrich" plumes missing.

Apparently D'Albertis overlooked the excellent account by Sonnerat, as nearly one hundred years later he wrote: "Although this species has been described many years, it is not yet accurately understood, having only been described from birds in a mutilated condition. My observations have been made in the natural haunts of these elegant birds, from numerous specimens both living and dead. These birds are found in the north of New Guinea. I met with them about 30 miles from the coast, at an elevation of 3,600 feet above the level of the sea, near Mount Arfak. I have never found the adult male in company with the females or young birds, but always in the thickest parts of the forests. The female and young male birds I have generally found in a much lower zone. This Paradise-bird is very noisy, uttering a note like 'Gnaad-gnaad.' It feeds upon various kinds of fruits, more especially on a species of fig which is very plentiful in the mountain ranges; at other times I have observed it feeding on a small kind of nutmeg. To clean its rich plumage, this bird is in the habit, where the ground is dry, to scrape, like a gallinaceous bird, a round place clear of all grass and leaves, and in the dust produced by the clearing, to roll over and over again—at the same time crying out, extending and contracting its plumage, elevating the brilliant silvery crest on the upper part of the head, and also the six remarkable plumes from which it derives the name of *sexpennis*. On seeing its eccentric movements at this time, and

LAWES'
SIX-PLUMED
BIRD OF PARADISE

(*Parotia lawesi*)

One-half natural size
f

1
MALE

2
FEMALE

SIX-PLUMED
BIRD OF PARADISE

(*Parotia sefilata*)

One-half natural size

3
FEMALE

4
MALE



Lilias

hearing its cries, one would believe it to be engaged in a fight with some imaginary enemy. This bird is named 'Coran-a' by the natives. I have also a skeleton of a young male of this species, which, although not in a perfect state, may no doubt be interesting, as showing the form of the cranium, on which there is an admirable muscular structure which enables the bird to elevate the feathers of the head. The feathers at the nape of the neck exhibit, when the rays of light strike upon them, a rich and brilliant metallic hue. The eyes are of a light blue, with a circle of a pale yellowish green colour." This seems the first record of a playing ground and display, and not a great deal has been added from natural observations, though a lot has been written about the display, as seen under artificial conditions. It would be difficult to paint a word picture of the somewhat grotesque positions the bird manages to assume in the presumed erotic display. It is also possible that the display differs a little in accord with the forms, but the general finale is that the umbrella is thrown out widely, while the head is depressed on to the breast, the six plumes being thrown forward and downward. In this position the nape band may be seen as a glittering crescent, while the breast shield is obscured by the head, the white frontal spot showing up with a slight golden tinge distant a little on each side. Before reaching this stage the bird reaches its head up, with the bill pointed upwards, and the wings and umbrella closely held in so that the length of the bird seems abnormal, especially as the plumes are also thrown forward in the same direction. After this it pulls the head down, throwing the plumes sideways and frilling out the umbrella, but still keeping the head up, but more horizontal. This is succeeded by the final display.

At the same time as the Superb was generically separated, the Six-plumed was given a distinct generic name *Parotia*, only one species, *sefilata*, being then known. The bird may be characterised as much larger than the Superb, similarly all black, with a shorter bill showing a large frontal tuft, a nape band of glittering iridescent scale-like feathers, with a breast plate of larger metallic feathers with rounded ends, more an irregular oval than triangular; on each side large neck tufts of velvet, and a cape-like black velvet back. All the rest of the plumage is black velvet, but the adornments are again peculiar. From each side of the head just behind the eye spring long, threadlike feathers with a small, feathery, rocket-shaped terminal, three feathers on each side. In addition, from the sides of the body, feathers extend to the length of the wing; these feathers are disintegrated, but the webs keep rather close so that they end in a square-cut manner at the same length. These are capable of movement, such as spreading round the body, and hence his ornament is known as the "umbrella"; the six head plumes can be moved in any direction. The tail is somewhat long and rounded, the legs rather long and strong, the feet large. The bill is comparatively short and straight, the exposed culmen laterally compressed, the tip short; the nasal groove is hidden by the encroaching feathering of the forehead, which develops into a large erectile tuft from the operculum of the nasal apertures; the interramal space is rather long, the gonys a little ascending. The wing is long, the primaries pointed, four, five and six subequal and longest, the fifth slightly exceeding the others; the first is short and less than half the length of the third, curved, narrow, and with a long spatulate tip; the second is similar, with likewise a spatulate tip, but none of the other primaries shows this;

the secondaries long, broad and velvety. The legs are long and smooth, the front with faint indications of scutation only, the back bilaminate; the front toes are slender, the mid toe longest, the outer longer than the inner, all claws long and rather shallow; the hind toe stout, claw long and curved, longer than the middle toe and claw. This generic description is drawn up from the type, as there are other species which vary a little in details, which will later be pointed out. As to the specific description of *sefilata*, the frontal tuft is bronze gold at its base and silvery white at the terminal half, the feathering rather stiff; the feathers of the rest of the head are soft and velvety black, rather long, while the nape band, consisting of a few rows of metallic tipped movable feathers, is glittering. In *lawesi* the coloration is still all black, but the frontal crest differs in formation, the nape frill is smaller, the secondaries exceed the primaries, while the tail is shorter and rounded. In *helenae* there is another crest variation, otherwise this is like *lawesi*; still another black bird has a crest like that of *helenae*, but has developed a long wedge-shaped tail. The females in these vary a little in coloration in agreement with the male variation in size. A very distinct and most beautiful evolution is the Carol Six-plumed, which has developed a particoloured umbrella of black, brown and white, shorter plumes with smaller rackets, and a glorious head-piece or helmet. The nape band and the breast shield are not much different, but all the feathers of the crown are tipped with golden bronze, the feathers at each side white tipped with a median white band ending in a golden tuft, round the eye bright gold, and the feathering is apparently more or less permanently erectile, at least full. The female is of the usual brownish above, barred below, so

that it is not known whether this represents an intermediate form in the development of the Six-plumed or whether it is a freak side issue. Nothing connecting the two umbrellas is known, nor is there much approach to the multicoloured helmet.

The typical species, *sefilata*, needs little detailed description, as it is all black save the white frontal tuft, the nape band of metallic feathers shimmering green to purple, the breast shield on the other hand golden green to bronze, the feathers rounded, the outer ones large and with a black streak medially. The measurements of the male are: bill from nasal groove 18 mm., wing 160 mm., tail 130 mm., tarsus 50 mm. The female is slightly less in the wing, but has a longer tail; thus bill 17 mm., wing 154 mm., tail 135 mm., tarsus 45 mm., but is very different in coloration, recalling the female of the preceding genus so much that specimens have been confused. The head is dark brown with a purple tinge, almost black, the remainder of the upper-surface dark brown with a chestnut tone, the wings and tail similar, the under-surface whitish barred with brown, the bars on the throat narrower and blacker, the under wing coverts also barred.

The south-eastern bird was called *lawesi*, and is also all black with the exception of the nasal tuft, which is bifurcate, incurved, quite unlike the single erect tuft of *sefilata*, the nape frill is more blue, while the tail is notably shorter. The tail only measures 85 mm. The female is similar to that of the preceding on the upper-surface, but the under-surface is rufous barred with narrow brown bars, becoming weaker on sides and obsolete on the abdomen and flanks, where feathers are lengthened and disintegrated, under wing coverts uniform rufous. The tail measures 100 mm. This was described

from the south side of the mountains, but De Vis named a *P. helenae* from the north side, the male of which was very similar in detail except the crest described, "the supra nasal part of the crest is erect and very low anteriorly, and ascends gently to the forehead; the frontal part is suddenly elongated and forms a compressed rounded lobe; the short anterior portion is bright bronze brown, the elevated posterior part is dark coffee brown, with a paler bronze brown reflection, and the adjacent parts of the head are similar in colour and lustre." The female is said to be only distinguished by the fuscous colour of the thighs, these being rufous in *lawesi*. This was described from Neneba, Mt. Scratchley, and recently a subspecies has been named from Morobe, a few miles north, the only character apparently

being the browner back in the male. The type of *helenae* seemed very like in every detail except the frontal crest to *lawesi*, and a specimen from near Morobe agrees very well in detail. The female of *helenae* was also like that of *lawesi*. Captain N. B. Blood, however, secured a pair in the Mt. Hagen district, which are very unexpected as they prove to be referable to the *lawesi* series. The male agrees in every measurement with those of *lawesi*, so that there is little or no ground for separation. But the female shows valid colour differences in the marking of the under-surface, the whole being rather deep rufous, closely cross-banded throughout from chin to under tail coverts, while the upper-surface is also a deeper red brown. So this has been named as a subspecies of *lawesi*, *Parotia lawesi exhibitata*.

WAHNES' SIX-PLUMED

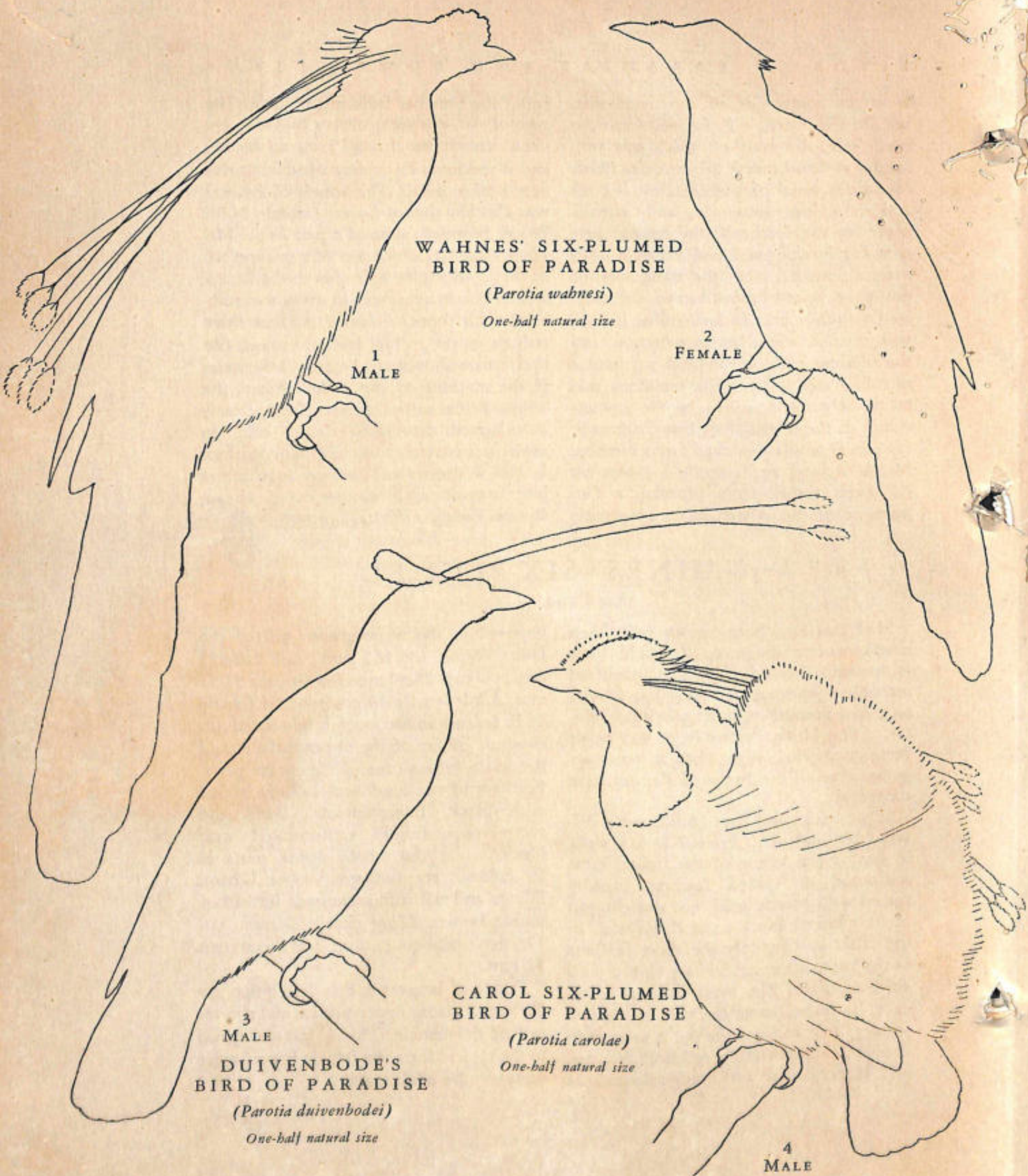
Plate v, Figs. 1 and 2

Had this bird been known only by a single or few specimens it would have undoubtedly been damned as a hybrid on account of its long tail. As it has proved to be not uncommon in its restricted habitat of the Huon Peninsula, it has never been questioned, save when it was suggested that all the forms of *Parotia* were conspecific.

It was described thus. Adult male differs from that of *P. helenae* at first sight by having the whole of the frontal crest composed of curled feathers broadly tipped with bronzy gold, not straight and entirely bronze black as in *P. helenae*. In the latter species only the short feathers at the base of the culmen are tipped with golden bronze. The most striking difference, however, lies in the tails of the two species; in *P. wahnesei* the tail is more than double the length of the tail in *P. helenae*, and is graduated and wedge-shaped, as

opposed to the square, even tail of the latter. Wing 156-165 mm., tail 212-217 mm., culmen 28-30 mm., metatarsus 51-54 mm. Adult female differs from the female of *P. helenae* in the much brighter reddish chestnut colour of the upper-surface, and the more rufous tone of the under parts. Feathers of the hind neck heavily barred with black. Interscapulum, back, and rump more faintly vermiculated with black, while the whole upper parts in *P. helenae* are uniform umber brown. Wings and tail rufous chestnut instead of umber brown. Wing circa 156 mm., tail 178 mm., culmen 25 mm., and metatarsus 52 mm.

Points of interest in this description are the vermiculated upper-surface and shorter tail of the female. This is interesting, as in the typical form the female has a longer tail than the adult male.



WAHNES' SIX-PLUMED
BIRD OF PARADISE

(*Parotia wahnesi*)

One-half natural size

1
MALE

2
FEMALE

3
MALE
DUIVENBODE'S
BIRD OF PARADISE
(*Parotia duivenbodei*)

One-half natural size

CAROL SIX-PLUMED
BIRD OF PARADISE

(*Parotia carolae*)

One-half natural size

4
MALE



Liliak Medlars

DUIVENBODE'S SIX-PLUMED

Plate v, Fig. 3

The original specimen of this curious form retained only one plume on each side of the head, while the second had all missing, but so many of the specimens have plumes missing that this seems of no moment at present. Nothing is known of its habits, the description herewith giving all the information on record. The male has the pectoral shield of a different structure and colour and is more extended than in the other black forms of the Six-plumed. The shield consists of a much larger number of rows of smaller, narrower, and more scutellate feathers, which give it a rougher appearance. The ruff-like development on the sides of the neck does not extend so far across the throat, in consequence of which the metallic feathers of the pectoral shield reach further upon the throat, gradually diminishing in size and number. The black central shaft patches on the lower laterals of the shield are considerably narrower and much less numerous. The colour of the pectoral shield is a glittering metallic grass-green, with some of the feathers on the edges of the shield washed and edged with blue, whereas in the other black six-plumed birds the shield is of a brilliant coppery greenish-golden colour. There is no long erect tuft on the forehead, and the crest on the front part of the head is in the form of a low cushion. The glittering occipital band of the several allied species is replaced by a large triangular, rather wedge-shaped, shield of glittering metallic steel-green feathers, the shield being edged with steel-blue, and extending from between the eyes to the occiput. There is one long head-plume on each side, and

the dark feathers on each side of the head-shield from behind the eyes are lengthened so as to form horns somewhat like those in the genus *Phonygammus*. There is no white anywhere on the head, and the colour of this part and the whole of the rest of the upper-surface is of a rich, deep, bronzy purple, not glossed with only brown as in the allied forms. The first and second primaries are less abruptly emarginate than in the nearly related species. Wing 150 mm., tail 115 mm., metatarsus 38 mm., culmen 34 mm. Habitat, Dutch New Guinea (Van Renesse van Duivenbode).

Note.—In all the other forms of Six-plumed there are six elongated head-plumes, but there is no sign of any having been pulled or shot out in this specimen. A second was received by the Paris Museum, but that has all the head-plumes wanting. Later it was recorded that this second species had also been given by M. Renesse de Duivenbode, with the locality "inland from Jaour, in the bay of Geelvink", and probably both came from the same place. It may be here noted that there were two Dutch merchants, father and son, named Renesse van Duivenbode, and that while the father did send birds to Holland, it is the son who was interested in Birds of Paradise, and after whom three different birds were named, a Rifle Bird, a Six-plumed (as above) and a true Paradise, all of which have been stigmatised as hybrids. A species of Parrot was also thus named, but I believe it was on account of the father, and its validity remains unchallenged.

THE CAROL SIX-PLUMED

Plate v, Fig. 4, and Plate XIII, Fig. 4

The six plumes are shorter and the rackets smaller, but the greater differences are the particoloured "umbrella" and the bright coloration of the head. The first note of this exceptionally beautiful Six-plumed was only heard a little over fifty years ago, apparently because it was a more inland bird, not living in the Arfak Peninsula, nor in the South-Eastern Mountains. It was recorded from "the mountains of the Amberno River", but the skin was later suggested to have been procured at the Weyland Mountains. Since then the species has been found in the Setakwa River district, the Mamberano, Lordberg on the upper Sepik, the northern slopes of Mount Wilhelmina, and now in the Mount Hagen district. From nearly every locality slight differences have been recorded, mostly in the female plumages. The male is a smaller bird than the black Six-plumed, but in structure it is quite in agreement. The males are readily recognisable by the distinct head coloration, which is taken on before the rest of the adult plumage and umbrella are developed. It may carry this stage of plumage a long time, as many birds have been met with this, but practically nothing has been recorded of its habits.

Structurally the bird agrees well with the type, so that no description is necessary save that of coloration, and this only in connection with the head and umbrella, the remainder of the plumage being similarly black, allowing for the throat and breast shield. The ornamentation of the head or helmet is a somewhat complex affair, having the centre of the crown with two small rows of incurved feathers such as are seen on the nasal groove of *lawesi*, but these are bounded by two elevated

rows of feathers which approach on the nasal groove and conceal the nostrils; the chin feathers are extended hair-like, lengthened on the edges of the jaws. The external head ridges do not reach beyond the nape, as they are stopped by the nape frill of metallic feathers, the plumes, showing a series of accessory small, wire-like feathers, such as were mentioned in connection with Duivenbode's Six-plumed, and are also found in the other species when searched for. The coloration of this helmet probably varies a little, but generally the central incurved feathers are tipped silky-white, anteriorly, but golden brown posteriorly, the external ridges black, the major anterior portion tipped with silky-white, the posterior half and the remainder of the feathers of the crown gold tipped; around the eye is a ring of gold, and below, developing into a throat patch, including the hair-like chin feathers, the colour is golden-fawn, becoming paler on the throat as it passes into the glorious yellow gold breast-plate with bronze to green sheen, the feathers with small black centre spots; the feathers of the neck are developed into puffs on each side, black, as are back, wings and tail, velvety with a purplish sheen more marked on the back; the iridescent nape frill varies from dark green through blue to purple; underneath the abdomen feathers are black, but the umbrella or flank feathers are tricolour, the feathers more separate and less disintegrated than in the type, the inner series black, median brown, outer white, but grading throughout, the adjoining feathers of the first and second being brown with black centres, and of the second and third, inner web brownish and outer one white, and so on. Bill and

legs black, eye yellow. The bill from nasal groove measures 19 mm., wing 148 mm., tail 79 mm., tarsus 46 mm.

The female is like those of the preceding, in general being dark brown, the edges of the wing and tail feathers tinged with rufous, the under-surface bright red-brown closely barred with black. The bill is more exposed and measures 4 mm., the wing 140 mm., the tail 100 mm., and the tarsus 45 mm.

The young male is like the female in coloration, but may take on the helmet coloration early, as so many males have been secured in this intermediate coloration showing little other feather change, although the body, wing and tail moult seems irregular. The variation throughout the range seems indeterminable at present, as with every addition to the original range new subspecies have been introduced, but they are generally of little interest save to the specialist, except the mystery one succeeding whose habitat is unknown. The original one was described

from "the mountains at the river Amberno", but this is now supposed to have come from the Weyland Mountains many miles away, and the bird coming from the Mamberano (=Amberno) has been renamed. A mystery bird with a black throat was separated as *berlepschi*, and this may be kept distinct until re-found, but a form from the Uakwa Valley not far from the Weyland Mountains was named *meeki*, as being like *carolae* with regard to helmet coloration, but with the chin as well as the upper half and sides of the throat black, not buff. Then helmeted young males and females from Lordberg on the middle Sepik were separated as *chrysenia*, while the "Mamberano" bird was called *chalcothorax*. Captain N. B. Blood secured a native-made skin at Mt. Hagen and then collected a helmet-coloured young male in the same district at Tumbiana, 6,000 feet, and this probably represents another subspecies, but the slight distinctions cited for *chrysenia* are not sufficient to determine.

BERLEPSCH'S SIX-PLUMED

This mystery bird appears to be very similar to the Carol save in the colour of the cheeks and throat, while the white frontal patch is said to be also smaller and the lateral feathers of the coronal crest to lack white tips. Attention was also drawn to the coppery hind neck, and as the female is still unknown, this bird must

remain indefinite until its locality is discovered. One amusing item is the fact that Kleinschmidt, who described it, claimed it for a valid species, not a subspecies, although he was the prophet of "Formenkreis", a grouping of species and subspecies into a series, so that they became inseparable in quality.

THE TWELVE-WIRED

Plate II, Figs. 3 and 4

The ornamentation indicated in the name is one of the most curious, although nearly every adornment can be so indicated, and there has been confusion in the naming, but never in the bird itself. Thus Valentyn included: "The white Paradise-bird is the rarest of all the species

and has two varieties, one entirely white, the other black and white. The first is very rare, and in habit much resembles the Paradise-bird of Papua. The second variety has its fore-part black, and back part white, with twelve slender, crooked, almost naked feathers. This kind is the

rarest of all, and is procured only through the people of Tidore, because it is found in those Papuan isles only which are little frequented, particularly in Wayghihu (called also Wadju, Wardju and Waygiu). Some suspect that they are imported from Serghile, in New Guinea." Then was added: "In 1689, a new species of black Paradise-bird was first seen at Amboyna, brought from Missowal, about a foot in length, with a shining purplish hue. Head middle-sized; bill straight; back as in the other species, adorned with purple-blue feathers, but under the wings, and on the belly yellowish, as in the apodous species. Back of the neck, mouse-coloured, greenish. In this kind it is observable that on the scapulae are bundles of green-edged feathers, which can be erected at pleasure, like wings. In place of a tail, it has twelve black, naked, setaceous and thready shafts, like pendulous feathers. Feet strong, with sharp claws. Head small; eyes encircled with black." To the first was given the name *Paradisea alba*, and then a little later, recognising that the first was merely an albino of the Papuan one, the name *alba* was transferred to the variety, and this was later called *melanoleuca* to correct the second erroneous use of *alba*. However, Forster, in his Latin translation of Valentyn's "Unknown Bird of Paradise", wrote *Paradisea ignota*, and this name has sometimes been used. The best authorities upon examination of the text have rejected this name, and *melanoleucus* must be used.

This is one of the most striking of the series, as the white mentioned is in life yellow, but the colour fades quickly and disappears when the skin is smoke-dried. The male is dark above with a long curved bill, the head feathers small and firm but not metallic, while the breast-plate is large and extensive, but composed of soft feathers with the outer feathers only metallic iridescent; the back is slightly glossed,

while the wings and short tail are heavily glossed with purple; the profuse yellow flank plumes with the twelve recurved shafts produce a wonderful effect, especially in conjunction with the bird's long red legs. The female is reddish above, the head and back blackish without any light superciliary streak, but underneath it is pale fawn closely cross-banded with brown, recalling the females of the preceding species.

Wallace's is the first account of its habits: "Is found in the islands of Salawatti and in the north-western parts of New Guinea, where it frequents flowering-trees, especially sago-palms and Pandani, sucking the flowers, round and beneath which its unusually large and powerful feet enable it to cling. Its motions are very rapid. It seldom rests more than a few moments on one tree, after which it flies straight off, and with great swiftness, to another. It has a loud, shrill cry, to be heard a long way, consisting of 'cah-cah' repeated five or six times in a descending scale, and at the last note it generally flies away. The males are quite solitary in their habits, although, perhaps, they assemble at certain times like the true Paradise-birds. All the specimens shot and opened by my assistant Mr. Allen, who obtained this fine bird during his last voyage to New Guinea, had nothing in their stomachs but a brown, sweet liquid, probably the nectar of the flowers on which they had been feeding. They certainly, however, eat both fruit and insects, for a specimen, which I saw alive on board a Dutch steamer, ate cockroaches and paya fruit voraciously. This bird had a curious habit of resting at noon with the bill pointing vertically upwards. It died on the passage to Batavia; and I secured the body and formed a skeleton, which shows indisputably that it is really a Bird of Paradise. The tongue is very long and extensible, but flat, and a little

fibrous at the end, exactly like the true *Paradiseae*. In the island of Salawatti the natives search in the forests till they find the sleeping-place of this bird, which they know by seeing its dung upon the ground. It is generally in a low bushy tree. At night they climb up the tree, and either shoot the birds with blunt arrows, or even catch them alive with a cloth. In New Guinea they are caught by placing snares on the trees frequented by them, in the same way as Red Paradise-birds are caught in Waigiou."

Guillemard caught one and kept it alive for some weeks, writing: "He is now wonderfully tame, and will eat out of one's hand. He feeds on the fruit of the Pandanus, or Papaw (*Carica papaya*) when it can be obtained, on cockroaches and occasionally on banana. He is fond of resting motionless, with the head sunk low on the chest. The top of the head is very flat and low, so that the upper margin of the eyes protrudes above it. He remains more or less quiet during the day, but in the morning and evening is more restless, moving from perch to perch with a peculiar bounding hop. In feeding he is most wonderfully neat! With his long sharp bill he catches a cockroach with lightning-like rapidity, taking it across the body. He then gives it a sudden snap with the beak, throws it up in the air, catches it lengthwise, and it is out of sight in an instant. In this operation he displays to advantage the lovely colouring of the inside of the mouth and throat (grass-green). The only note he has as yet uttered in confinement is a single unmelodious croak."

The technical description of the genus *Seleucidis* follows: Large birds for this series with very long arched bill, medium wings, short tail and medium legs and strong feet. There is a very large breast shield unlike those of the preceding, being composed of soft feathers, and can be

puffed out, hiding the body; side plumes develop profusely and bear long recurved wires on each side. The bill is very long, arched, very compressed laterally, tip decurved with a slight posterior notching; nostrils in fore part of groove almost concealed by feathers, though base of culmen is not hidden; a narrow interramal space feathered with a small chin tuft showing; gonyes very long and almost straight. The head is flat, covered with small stiffish feathers, a naked band behind the eye; the feathers of the back are full as if forming an erectile tippet. The wing has the first primary narrow sickle-shaped, the second broader and less sickle-shaped, while the third and succeeding ones are normal and pointed, the fourth to seventh subequal and the fifth a little the longest; secondaries are broad and rounded, exceeding the second primary in length. The tail is rather short, the feathers rather narrow, square, almost slightly emarginate, but the central pair of feathers a little longer than the next pair. The leg is not very long, but is naked above the joint, making it appear long, especially as it is brightly coloured; it is stout, but the front and back are smooth; the legs are strong, the mid toe long and thin, the claw long and curved, the outer and inner toes subequal, the hind toe very long and stout, claw long, stout, curved. The male, *S. melanoleucus*, is black above, the feathers of the head slightly metallic but not scale-like, the back tippet with bronze reflections, the edges of the wing and tail feathers with purple sheen. Underneath there is the huge breast shield of velvety black feathers extending outwards on each side, the outer feathers with broad metallic tips of bright green. The flank feathers profuse, disintegrated, of bright yellow fading to pure white after death and showing twelve elongate wiry black shafts strongly recurved backwards. The bill is

ABERRANT RIFLE BIRDS

Plate VI

Some fifty odd years ago Meyer introduced a new species of Rifle Bird received from North-West New Guinea. This differed from the normal Magnificent in the possession of a nuchal collar, and therefore Meyer stated it might represent a new genus.

A year later another different form of Rifle Bird was described by Oustalet which was also a trade skin, probably also from the North-West of New Guinea, whence most trade skins were being shipped. It must be remembered that these skins may have been procured hundreds of miles distant from the place of export. It has been shown that while some of the North-West birds may be regarded as coming from the Arfak Mts., others may have come from mountains to the south-east of Geelvink Bay.

Another specimen was described as new from the Arfak district, and this was soon recognised as being the same as the preceding. Within ten years Rothschild had secured no fewer than seven specimens of this bird, and when Sharpe examined the types he introduced a new generic name for the species, commenting: "M. Suchetet, in his zeal for the discovery of hybrids in a state of nature, has fallen foul of the present bird (described, too, by his countryman, Dr. Oustalet), and actually suggests the possibility of its being a hybrid between *Craspedophora magnifica* and *Seleucides nigricans*. This is certainly one of the most extraordinary propositions ever conceived in the history of ornithology."

Still another strange bird turned up, and this was distinguished generically also on account of its lacking the breast shield of the Magnificent, though showing elongate flank feathers, but with the central

tail feathers elongated, quite unlike the short tail of that bird.

A few years later a bird was described from Kaiser Wilhelmshafen, N.E. New Guinea, and placed in the genus *Paradisea*. It was obviously very unlike any species of *Paradisea*, so the trivial name of *mirabilis* was given to indicate its unlikeness, and it was suggested by its author, who was unfamiliar with New Guinea birds, that it might be a hybrid between *Seleucides* and *Paradisea*, a very unlikely combination.

Another genus had been introduced by Meyer for a wonderful form which also comes into this series. The bird has a largely increased breast-plate and a nape frill of iridescent feathers, but has the middle pair of tail feathers lengthened about as long again as the tail.

In an extraordinary essay Stresemann discussed all the rare Birds of Paradise and evolved an amazing hypothesis that they were all hybrids, and furthermore selected a parentage for each form. This would not have mattered much had not his pupil Mayr boldly written down this delightful fancy as fact. Apparently no examination of the possibilities of error of imagination worried either, as there is no actual fact concerning this fantastic hybridisation theory. It may be proved in the centuries to come that all species are derived from hybridisation, even as has been suggested in the botanical world, and then Stresemann will appear as a prophet. However, until evidence is adduced proving the validity of Birds of Paradise hybrids, the matter must be left open. The forms are here figured with descriptions and the suggestions of parentage put forward by Stresemann and Mayr. With regard to the Rifle Bird series and

black, the eye bright red, and the legs pale coral-red. The bill measures 65 mm., wing 174 mm., tail 83 mm., tarsus 45 mm.

The female has the same long bill, but the feathering is normal, lacking breast shield and flank plumes, and is reddish brown above, barred below. While the bill, wings and legs are rather smaller in their measurements, the tail is longer, rounded, the feathers rather narrow and pointed. The head and back of neck are black with a purple sheen; there is no superciliary streak, the rest of the upper-surface is bright reddish brown; the whole of the under-surface is pale buffish white closely barred with brown, the bars small and indistinct on the throat and becoming obsolete on the under tail coverts, the wing coverts also more rufous with blackish barring. The measurements are bill 60 mm., wing 165 mm., tail 118 mm., tarsus 40 mm.

The male in immature plumage resembles the female closely, but with a darker throat, and then takes on the head and

breast coloration while still retaining the female back, wings, tail, and under cross-barring; then the upper-surface becomes black and the ornamental flank plumes develop last and apparently grow larger and finer each moult."

This is a lowland bird, and has escaped the critical examination of the preceding species; only one local form has been separated, though probably many occur in nature. The subspecies was named *auripennis* from Wewak, north coast of New Guinea, as having a shorter wing and slenderer bill; the flank plumes deeper golden-yellow with the breast shield having wider green tipping. The female browner below with darker, closer barring. Stresemann admitted these from the Sepik Mountain lowlands, giving the wing measurements as males 160-168 mm., females 152-158 mm., which does not show much difference in size. Rand has also recorded this from Bernhard Camp, wing measurement of male 169 mm., immature male 163 mm.

ABERRANT RIFLE BIRDS

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BENSBACH'S RIFLE BIRD

(*Anthothorax bensbachi*)

One-third natural size

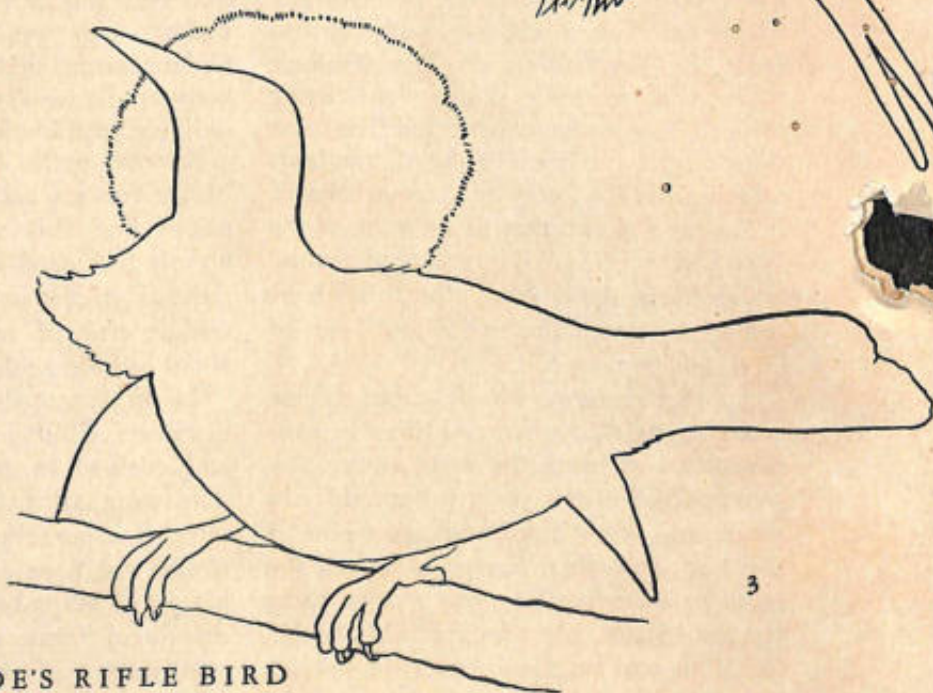
2

REICHENOW'S
WONDERFUL
RIFLE BIRD

(*Quesoparens mirabilis*)

One-third natural size

1

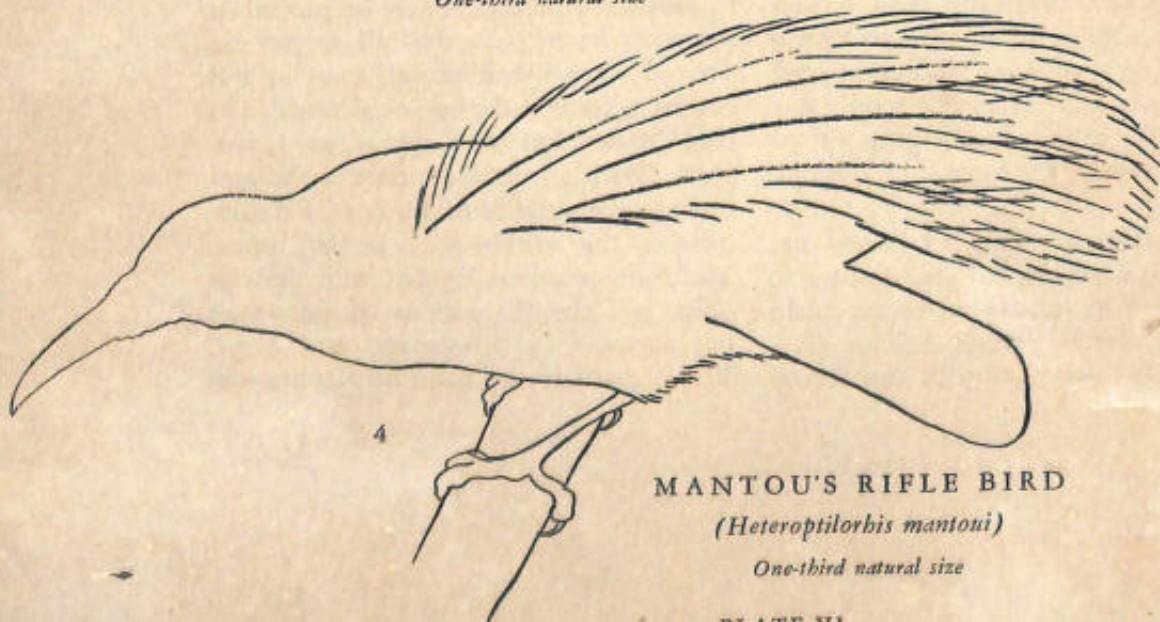


3

DUIVENBODE'S RIFLE BIRD

(*Paryphophorus duivenbodei*)

One-third natural size



4

MANTOU'S RIFLE BIRD

(*Heteroptilorhis mantoui*)

One-third natural size



Libby 1902

associates, the presence of iridescence in the breast shield, which varies in extent and a little in coloration. In the original Rifle Birds, the breast-plate is small, the head is also plated, there are flank plumes, the wing feathers are highly specialised and the tail is very short, with the two middle feathers even shorter and with metallic reflection. There is no concern with these, as they live only in Australia, but the New Guinea Rifle Bird differs somewhat in that while the head and breast remain similar, but with a longer, more curved bill, flank feathers are developing into plumes. The first of the mentioned of these aberrant birds was the first arranged alongside the Magnificent, but have since been removed. The Superb, while showing the metallic head and breast-plate, has developed the latter into a large expansible arc; in addition it has created an enormous nape frill of velvety feathers. The wing is more normal and the tail a little longer, but there are no flank plumes. The Six-plumed Rifle Bird shows internal variation in the production of four to six species, the dominating form being, of course, the six plumes; in addition, however, is the production of flank plumes into an "umbrella" of a peculiar character. While the breast shield remained as in the Rifle Birds, the metallic head feathering has been reduced to a line on the nape. The tail, however, is lengthened from the usual shortness of the original forms to a long wedge shape, the other variations being in coloration of the top of the head and of the gape.

The aberrant Twelve-wired shows no iridescent metallic feathering either on the head or breast, but has a large shield covering the breast entirely of velvety feathers,* and this appears to be mobile and is fringed with a row of glittering feathers, the rest of the plumage being a drab, normal feathering, save the pro-

duction of large bunches of yellow disintegrated plumes on each side of the body, and these reaching below the tail; six of these plumes on each side have developed into hard shafts which continue as wires a little further than the others, and then bend sharply backwards and appear as wires reaching to the head. This form has a large range on the lowlands, without showing much variation, and must be regarded as stable, so that any of its offspring would certainly show some indication of this very peculiar attribute. The first-mentioned below of these aberrant Rifle Birds was named after Mantou, and it may be called Mantou's Rifle Bird for the present. Because the Twelve-wired and Magnificent were referred to by Suchetet (a most unreliable recorder), Mantou's bird has been actually given this parentage. As pointed out, the former surely would transmit some of its basic peculiarity to its progeny, but no definite sign appears present. The bird shows black flank plumes somewhat like those of the Magnificent, but not in any sense recalling those of the Twelve-wired. Unless a much better guess is made, Mantou's bird must remain unchallenged as a species, and it shows nothing to belie that rank. The fourth was named after Duivenbode and may be called Duivenbode's Rifle Bird. This one has had cited as parents the Superb and the Magnificent. It lacks the flank plumes of the latter and shows a nape frill and a triangular breast-plate recalling that of *Lophorina*, but here again there is no evidence of any hybridisation, and it seems merely a gesture to suggest that the Magnificent was responsible for it. The original specimen merely came from "New Guinea", and Mr. Shaw Mayer told me that he procured a similar bird from the natives inland from Yule Island, which suggests that it may live in the high ranges, at present ornithologically unknown, east of the Owen Stanley Range.

The third, Reichenow's Rifle Bird, would be wonderful if it were a hybrid between *Paradisea* (the true Birds of Paradise) and the Twelve-wired. These two genera are not at all closely related, and hybrids would be almost a physical impossibility, as well as most improbable. This was described with a definite locality, where other curious birds known now to be species, but which might equally as well have been suggested as hybrids, live, and wonderful to relate, it was placed in the same genus as another supposed hybrid with different parentage, Bensbach's Rifle Bird, supposed to be descended from a *Paradisea* (Bird of Paradise true) and a Magnificent Rifle Bird. This is more puzzling than any of the quaint theories of hybridisation yet put forward; that two birds of different genera widely separated should interbreed with each other and produce an offspring inseparable from that of a different pair. To such extremes do supporters of an unlikely thesis go for support of their fantasies, even to the

elimination of any semblance of verity. Anyhow, Bensbach's bird has the metallic cap of the Magnificent, but lacks the breast-plate, yet shows the flank plumes, and then produces a long tail with two middle feathers lengthened and slightly narrowed. There is nothing whatever to suggest the intervention of *Paradisea* in any way, and that group may be cast out of the matter entirely. It would be folly to suggest any other parent to whet the appetite of hybrid-hungry workers, so the bird must stand on its merits at present.

Back to the "wonderful" bird, which was placed in the same genus, though of suspected different origin. It differs appreciably from the preceding in coloration, long flank plumes and similar long tail, and looks more like a hybrid than any of the others, but no guess could fix the parents. Two birds are known, and they were not critically described, so that the nature of the flank plumes was not determined, neither was that of the tail structure.

MANTOU'S RIFLE BIRD

Plate VI, Fig. 4

The bird known as Mantou's owes its name to the fact that Oustalet gave it that name on account of its donor. A little later it was again described in Holland and named after its collector, Bruyn. Sharpe recorded: "This is a very fine species of Rifle Bird, but as yet no perfect specimens have been received in Europe, so far as I am aware. The original example was a plumassier's skin, which found its way into the hands of M. Mantou, who presented it to the Paris Museum. I have seen a second in the Rothschild Collection, while a third is in the Leyden Museum. (A few years later Rothschild alone had accumulated seven specimens, so that the present number is unknown.) The habitat of the species is

not known, but it is believed to be some part of North-Western New Guinea. The principal differences between *C. mantoui* and *C. magnifica* are as follows:—The flank plumes are conspicuously longer, and the central tail feathers are darker, not being dark metallic green in all lights as in *C. magnifica*. The back of *C. mantoui* is more violet, the sides of the crown and neck purple, and the structure of the breast shield is different, not being continued in a median line to the chin, but having the feathers crinkled, instead of being scaly; the lower part of the shield, moreover, has only one band of golden bronze, and no black band at all. The shape of the shield is rounded and not so triangular as in *C. magnifica*. The following descrip-

tion has been taken from the type of *C. bruyii*. Dr. Büttikofer thinks his bird may be distinct, but I can see no difference. General colour above purplish black, with a purplish violet gloss, with velvety black tips; wing coverts velvety black, glossed externally with steel blue, the primary coverts similarly coloured, the edge of the wings purple; quills velvety black with a steel-green gloss, the inner secondaries with purplish violet; tail feathers velvety black, glossed with purple, the margins of the feathers steel blue, with which the centre feathers are glossed; crown of the head metallic steel green, the feathers scaly in appearance; the sides of the crown and the sides of the face and neck as well as the upper

throat purplish violet, with more distinct purple on the latter; lower throat steel-green, united to a beautiful shield of scaly metallic-green feathers, which are crinkled and have a purplish-violet gloss; the lateral feathers of the shield black, with a steel-green margin; breast and abdomen purplish red, with a bronzy reflection, this portion separated from the shield by a narrow band of golden bronze; the long flank feathers blacker with a purple gloss, the long feathers becoming elongated into blackish filaments; a tuft of white feathers on the upper part of the thighs; under wing coverts blacker, with a purplish gloss. Total length 280 mm., culmen 52 mm., wing 175 mm., tail 76 mm., tarsus 43 mm."

DUIVENBODE'S RIFLE BIRD

Plate vi, Fig. 3

Meyer wrote: "This new species I dedicate to M. C. W. R. van Renesse van Duivenbode, of Ternate, to whom science is already indebted for many interesting additions to the Papuan avifauna. The female is as yet unknown. This Paradise-bird is easily distinguished from *C. magnifica* and *C. intercedens* by the elongated erectile nuchal collar with its central feathers shorter (3 cm.), its lateral ones longer (4 cm.), as also by the following characters:—The whole upper side, wings, and head, except its metallic green top, are more reddish violet, whereas especially in *C. intercedens*, the colour is decidedly blue violet; the metallic green breast shield lessens towards the throat to a narrow band of only 1 mm. breadth, and ceases altogether at a distance from the base of the bill, equalling the length of the free mandible; this narrow metallic green stripe is surrounded by a violet velvet-like one, and this latter again by a broad olive-coloured zone. The lateral

feathers of the metallic breast shield are more elongated (over 3 cm. long, only 2 cm. in the two other species); the narrow line of feathers beneath the metallic of the breast is of less brilliant colours; in *C. duivenbodei* it is dark olive with a slight purple gloss, and in the middle of the breast less vivid. The green metallic breast shield covers at its distal end a layer of feathers, margined with black and with metallic blue subterminal spots. The breast and belly are darker; the ornamental flank plumes are short, they do not reach the tip of the wing; the inner webs of the first two primaries are cut out at their tips, and the whole wing has not the remarkable rounded form of the other two species." And added: "Though I am not inclined to create a new genus for every new Bird of Paradise, I presume that this species will soon be generically separated by someone on account of its erectable nuchal collar. In such case I would propose to call the new genus *Paryphephorus* (collar bearer)."

BENSBACK'S RIFLE BIRD

Plate vi, Fig. 2

The type was presented to the Leyden Museum by Mr. J. Bensbach, the Dutch Resident at Ternate, and Sharpe wrote: "It was rightly recognised as a new genus nearly allied to *Ptilorbis* and *Craspedophora*, and has the flank feathers developed as in those genera; but it lacks the metallic breast shield and *Ianthothorax* is further distinguished by its elongated central tail feathers, which are metallic. It has, moreover, the first primary emarginate near the end of the inner web as in *Astrapia* and *Parotia*.

Adult Male—General colour above purplish black, with dark steel-green and purplish gloss when held away from the light; the lower back and rump apparently of the same colour as the back in the adult bird, but in the present specimen these parts are sandy brown; wings apparently black in full plumage, with a gloss of metallic green, but the wing coverts sandy brown and the quills bronzy brown,

the innermost secondaries paler brown towards the ends; upper tail coverts steel green, with black shafts, but the green more of an oily shade; crown of head metallic oily or golden green, with steel green and even bronzy reflections; sides of face and throat also metallic green, inclining to steel blue on the throat, the lower throat scaly in appearance, more bronzy green, with purplish and even leaden green reflections; fore neck and breast purplish black, forming an ill-defined shield, the abdomen browner, but glossed with purplish black; flank feathers close-set and long, dark brown, the longer feathers with elongated points, on which the barbs are very much dissociated; bill and feet black; iris red (*Bensbach*). Total length 330 mm., culmen 44 mm., wing 170 mm., tail 120 mm., centre tail feathers 204 mm., tarsus 40 mm. Said to come from the Arfak range of mountains in North-Western New Guinea."

REICHENOW'S RIFLE BIRD

Plate vi, Fig. 1

Reichenow described this bird in detail from Madang, Northern New Guinea, the locality where an entirely new Bower Bird has since been discovered, so that this species may still be found in nature. Rothschild described the type thus: "Adult male. Head, occiput, chin, throat, and sides of head and throat covered with a thick mass of close, small, velvety, scale-like feathers, glittering steel blue; hind neck, inter-scapulum, and upper back blackish steel blue. Lower two-thirds of back and upper tail coverts liver-brown intermixed with blackish; tail sooty black-brown, outer webs saturated and washed with steel blue, central rectrices narrow and pointed, about one inch longer than

the rest, bright steel blue. Quills deep brown, rest of wings and upper wing coverts liver-brown intermixed with brownish black. Breast and upper abdomen deep velvety purplish brown, flanks paler; lower abdomen yellowish grey streaked with purple brown. Elongated flank plumes yellowish grey, washed with pale grey brown. Wing 185-195 mm., tail without central rectrices 130 mm., central rectrices 155 mm., elongated flank plumes exceed central rectrices by 211 mm. (sic), culmen 46 mm., metatarsus 50 mm.

"The type has the two central rectrices missing, but a second example in the Tring Museum, a legless, flat, Arfak skin, has

them present. The latter only differs from the type in having the five pairs of rectrices much paler brown, only glossed with steel blue. As, however, this gloss is confined to one side of the tail, it shows the bird to be less adult than the type, and

so I cannot attribute the paler tail to anything but youth. Professor Reichenow has described this bird under the generic appellation of *Paradisea*, and has stated that it is probably a hybrid between *Paradisea minor* and *Seleucidés ignotus*."

WILHELMINA'S RIFLE BIRD

Plate XI, Fig. 4

Sharpe's description of this bird from the specimen in the Leyden Museum, reads: "The genus *Lamprothorax* occupies a well-marked position, being distinguished from *Lophorbina* and the other allied genera by its square tail, with two elongated metallic green centre feathers. There is also a very distinct frill round the hind neck. Male (not quite full-plumaged) velvety brown, blacker on the rump and upper tail coverts; the back much mixed with reddish-brown feathers, and especially on the wing coverts; the outer wing coverts purplish violet, the quills blackish glossed with purplish violet; the inner secondaries more or less reddish brown. The plumage of these parts is, I think, imperfect, and I expect that the wing will be velvety black; tail black with a purplish violet gloss, the two centre feathers metallic steel green; head and neck purplish

violet, with a tinge of leaden grey, the lores and fore part of the cheeks having a velvety black appearance; the feathers of the hind neck elongated and forming a frill; throat, sides of the face and sides of neck purplish bronze with a bronzy shade on the sides of the face; chin and upper throat bronzy; lower throat, fore-neck and chest metallic green, forming a shield, with some beautiful reflections of purple and green, especially on the lengthened feathers on the sides of the shield; breast, abdomen, thighs and under tail coverts velvety black; under wing coverts with a violet shade. Total length 315 mm., culmen 28 mm., wing 127 mm., tail 73 mm., centre tail feathers 148 mm., tarsus 35 mm. The type came from the Arfak Mountains in North-Western New Guinea."

WATTLED BIRD OF PARADISE

(*Paradigalla carunculata*)

One-half natural size

1
MALE

2
FEMALE

3
MALE

4
MALE

MACGREGOR'S
BIRD OF PARADISE

(*Macgregoria pulchra*)

One-half natural size

SHORT-TAILED
WATTLED BIRD OF PARADISE

(*Paradigalla brevicanda*)

One-half natural size



Lilad H. 1874

THE WATTLED BIRDS OF PARADISE

Plate VII, Figs. 1, 2 and 4

Two birds each bearing facial wattles are placed together only for the reason that the location of the second is quite a problem at present. Of the first, called the Wattled Bird of Paradise, almost less is known than of any other form, as it has neither much history nor is there much known of its habits, and the only point of interest is the discovery of a second species or form differing a little in structure.

Thus, when Lesson was issuing his Monograph, he introduced a new genus with a short but recognisable description in his Synonymic Index. He gave no particulars as to where the bird came from or by whom it had been collected, and the entry was overlooked. In 1840, five years later, Lesson described a specimen in the collection of Dr. Abeille at Bordeaux, apparently the one he had included above, and the only one known at the time. Then when the ornithological results of the *Voyage of the Bonité* were issued a bird was figured under the name *Astrapia carunculata* by Eydoux and Souleyet from two trade skins secured in New Guinea, and the name was used from this description and figure. Somehow one of these specimens went to Philadelphia and was recorded by Sclater in his usual careless manner, "The Philadelphia Collection also possesses the only known example of *Paradigalla carunculata*, described and figured by Eydoux and Souleyet in the *Voyage of the Venus*."

The figure given by Eydoux and Souleyet was excellent, and there has never been any doubt, although the specimen was a trade skin and it was not until Meyer explored some thirty odd years afterward that perfect skins were secured. As all came from about the same locality, and showed approximately the same col-

oration and structure, the species stood quite alone for another forty years, until the hinterland of Dutch New Guinea was explored. Then a curious short-tailed form was discovered at Mt. Goliath, immediately afterwards another at the Utaqua River, and since in the Schraderberg, the northern slopes of Mt. Wilhelmina, and now in the Mt. Hagen district.

The original type was a blackish bird with green gloss, the crown with metallic scale-like feathering, and possessed a strongly formed wedge tail, with the central two feathers elongated but not thinned, the feathers being a little narrower and pointed only. The most notable feature was the presence of a large facial lappet from the base of the bill in front of the eye extending upwards to the crown, but always in front of the eye; there was also a similar growth from the base of the lower mandible, as if of separate growth, as its colour varied from that of the upper one. The tail was about the same length as the wing.

The new form which Rothschild and Hartert called *brevicauda* agreed in general coloration and face adornment, but with a remarkable small tail which was less than half the length of the wing and square, with the two central feathers slightly shorter. The wing was nearly an inch less than that of the long-tailed bird. As above noted, this short-tailed form has been found along the central mountains, showing slight variations only. These will be discussed hereafter, but there seems to be little information as to habits.

Beccari wrote: "As to *Paradigalla*, I shot one from my hut, whilst it was eating the small fleshy fruits of an *Urtica*. It likes to sit on the tops of dead and leafless trees, like the *Mino dumontii*. The finest ornaments of this bird are the wat-

tles, which in the dried skin lose all their beauty. The upper ones, which are attached one on each side of the forehead, are of a yellowish-green colour; those at the base of the lower mandible are blue, and have a small patch of orange-red beneath. The Arfaks call the *Paradigalla* 'Happoa'."

It has been overlooked up to now that Des Murs had recorded in 1858: "Although described for the first time in 1835, only by Lesson in the *Revue Zoologique*, this species existed before in a rich collection which J. Verreaux had formed and possessed in 1823, and carried in his Catalogue the name of *Astrapia carunculata*. Verreaux had even made a very detailed description, which he had sent to Vieillot to be reproduced in the *Galerie des Oiseaux*; finally the drawing has even been made at the time by Oudart, painter at the Museum of Natural History, Paris. Through unknown circumstances, everything remained in the custody of Vieillot, and this interesting species is buried, ignored until the day of Lesson, who made of it the type of the genus *Paradigalla*."

This description and drawing may be still preserved in Paris, and it would be interesting to know if the finder of this first specimen is recorded. The genus *Paradigalla* was founded principally on the facial wattles, and then on the black coloration and long, graduated, pointed tail. It was first regarded as an *Astrapia*, and it seems to be a connecting link between the Rifle Birds and the Long Tails. The bill is more like that of the latter, and the long tail might also prejudice in that favour, but there are no ornaments to indicate relationship with either.

The bill may be described as long, straight, laterally strongly compressed, with no basal expansion, culmen arched and keeled, tip decurved a little, sharp,

posteriorly slightly notched, nasal groove small, nostrils long, linear, operculate, tuft of feathers produced forward on operculum; interramal space small, triangular, the apex unfeathered, chin feathering with bristly tips, gonys very long, semi-keeled, a little ascending. Wing feathers pointed, first primary short, only about half the second, the third a little longer and just exceeded by the fourth, fifth subequal, sixth, seventh a little shorter, secondaries very long, tips rounded, almost within 10 mm. of the longest primary, decreasing in length a little inwards. Tail long or short, wedge-shaped or straight, feathers of narrow to medium breadth. Legs very stout, outer face smoothly scutellate, back bilaminate but with reticulate scaling anteriorly; feet strong, anterior toes long and slender, mid toe longest with long claw, lateral toes also long, claws smaller; hind toe very long and stout, claw long and powerful, hind toe and claw longer than middle toe and claw. Coloration all black, the feathers of the posterior half of the crown, and nape small with metallic iridescent tipping. A large wattle proceeds along the upper side of the gape, from there upwards in front of the eye to the middle of the crown and then forward to the base of the nasal groove; a similar one on the other side reaches in the middle, and these cover the fore part of the crown, which beneath them is devoid of feathering. Along the base of the lower jaw is a narrow, fleshy wattle of a different colour, reaching the same length backward. The typical bird has a long, regularly wedge-shaped tail of narrow, rather pointed feathers, while the second (and third) species has the tail very short and straight, square with feathers of medium width. In almost any other case these would be separated at least subgenerically, but in this case the immature stages of the short-

tailed forms show longer tails than the adult. However, more information is needed, as Ogilvie-Grant recorded that his species measured 92 mm. in the tail, the

middle feathers, which he assumed to be the adult feathers, 68 mm., this last figure being longer than any other of the short-tails recorded.

THE SHORT-TAILED WATTLED BIRD

Plate VII, Fig. 4

The Wattled Bird had been known for more than three-quarters of a century only from the North-West and not commonly, when Meek, penetrating into the high altitudes in Dutch New Guinea, collected a very similar bird at 5,000 feet with only a short tail. Rothschild and Hartert obviously named it *Paradigalla brevicauda*, writing: "This extraordinary new bird is in colour almost exactly like *Paradigalla carunculata*, being velvety black, with the head, nape, and fore neck dark metallic green, almost olive green. In the male the whole back and scapulars are glossed with oily green; this is not seen in most skins of *P. carunculata*, but in one in the Tring Museum it is about as much developed as in most *P. brevicauda*. The median and greater upper wing coverts are glossed with green, and the secondaries have sharply defined outer edges of a dark golden green, which colour is also to be seen on the distal portion of the inner webs, while the primaries are of a glossless black. These green outer edges to the secondaries are mostly duller and sometimes purplish in our skins of *P. carunculata*, but not much importance is to be attached to this difference, as the skins of *P. brevicauda* are quite fresh and properly skinned, while those of *P. carunculata* are old and remade skins. The great and very striking difference of this new species is the short and straight, slightly emarginated tail, the central rectrices being slightly shorter, whereas in *P. carunculata* the tail is long and cuneiform, the middle tail feathers exceeding the lateral ones by about 60 to 65 mm. A very peculiar fact,

showing evidently the line of evolution, is that the younger birds have the tail longer than the adult birds, i.e., from 35 to 40 mm. longer. The first two primaries are less sharply pointed and less attenuated, and the third is comparatively longer than in *P. carunculata*. Wing 154.5-160 mm., tail 51-54 mm. (against 170-180 mm. in *P. carunculata*), bill from end of nasal tufts (the base of the bill on the forehead being difficult to reach on account of the wattles) 25-26 mm., metatarsus about 47 mm. The adult female resembles the male, only the crown of the head is not quite so strongly glossed, and the back has hardly any greenish gloss. Young birds are like the female, only the plumage is duller, more brownish, the tail longer, and the wattles shorter. Iris dark brown, feet dark vandyke brown, bill black. The lappets on the upper mandible (and small hidden wattle at base of lower) are creamy yellow, the rugose wattle-like skin at base of lower mandible cobalt-blue. Type: adult male, Mt. Goliath, Central Dutch New Guinea, 22.1.1911. No. 5164. A. S. Meek coll. Hab. Mt. Goliath, at elevations of not less than 5,000 feet."

Very soon after Ogilvie-Grant described a *Paradigalla intermedia* from a "Male vix adult. Similar to *P. carunculata* Eyd. and Souleyet, from the Arfak Mountains, but much smaller and with a conspicuously shorter tail. Nasal caruncles and base of bill lemon-yellow. Total length about 250 mm., wing 155.7 mm., tail 75 mm., tarsus 43 mm. In *P. carunculata* the wing measures 170-180 mm. and the tail 167 mm. Hab. Utakwa River. Camp No. 60

5,500 ft. 25.11.13. With its nest and nestling, the latter having the wattles on the sides of the face almost as well developed as in the nearly adult male." The measurements were later corrected "to a length about 270 mm., wing 155-160 mm., tail 92 mm. (to end of middle feathers 68 mm.), tarsus 43 mm. In the type specimen only the middle pair of tail feathers are those of the adult plumage and are much shorter than the five outer pairs, which measure about 92 mm. This species is intermediate between *P. carunculata* and *P. brevicauda*, Rothschild and Hartert, from Mount Goliath. The latter shows the same peculiarity as the present species, the tail in the young bird being much longer than that of the adult."

Then Stresemann recorded *P. brevicauda* from the Schraderberg (6,000-7,000 ft.) and the Weyland Mts., giving the measurements of the former as male wing 153 mm., mid tail 60 mm., female wing 154 mm., tail 64 mm., and wing 150 mm., tail 59 mm. Hartert and others gave the wing measurements of Weyland Mts. birds as male 156 mm., females 147-152 mm., but no tail measurements were given. Recently Rand has reported *P. brevicauda* from the northern slopes of Mt. Wilhelmina: "Found at 2,200 meters (7,300 odd feet) on the Bele River, and from 1,600 to 1,800 meters (over 5,000 to 6,000 feet) on the Idenburg Slope. Wing male 157-160 mm., females 149-153 mm. (2,200 m.), 161 mm.," noting, "was an uncommon bird, usually found sitting rather inactive in the lower substage. One stomach contained fruit; another fruit, insects, and a small frog."

Captain N. B. Blood has now extended the range of *P. brevicauda* to the Mt. Hagen district, and the altitude to 10,000 feet. These birds will be described below, but criticism of the foregoing, all that is yet known of the short-tailed forms, shows that all except *intermedia* have a tail vary-

ing from 51-64 mm., with *intermedia* at least 68 mm.

While the long-tailed form was recognised as an *Astrapia* form (or related to the Long Tails), these short-tailed ones would not suggest that relationship, and in some features recall the Rifle Birds, e.g., in the bill formation, the scaling of the head, the primary structure, the development of the secondaries, the short tail with the two middle feathers shorter than the others, but differ in the presence of facial wattles, lack of breast shield, and absence of metallic colouring of central tail feathers. Another discouraging item is the presence of the facial wattles in the nestling, and the uniform brownish black coloration which is very unlike that of either the Long Tails or the Rifle Birds as a whole. The adult male from Mount Hagen district has the head feathering iridescent oily green, intermingled with the black bases, not showing as a metallic plate; the back velvety black, feathers dense, with a brownish sheen, the wing coverts and secondaries also velvety black, the edges minutely fringed with bronze; the primaries dull blackish brown, the under-surface generally dull black, but the chin and throat with a slight sheen; the flank feathers are a little elongated and disintegrating; the central tail feathers are velvety black and rounded tipped and a little shorter than the others, which are similar, forming a square tail. The bill measures from nasal tuft 26 mm., wing 160 mm., tail 59 mm., central pair of feathers 5 mm. shorter, tarsus 42 mm. Another male, apparently a slightly younger bird, is similar in detail, save that the metallic head feathers are duller, darker green, the back is browner, and the under-surface duller. The wattles are as well formed and the bill is as long, the wing the same length, but the tail is longer, 70 mm., and the central feathers

are not shorter, while the tarsus is the same as in the adult. This seems to confirm the preceding, and it may be concluded that all the forms of the short-tailed save *intermedia* may be classed as *brevicauda*, having a wing length of 150-160 mm., with the adult male tail feathers less than 60 mm., the immature and female having the tail feathers say 10 mm.

longer. From Ogilvie-Grant's measurements, the tail of his *intermedia* is absolutely longer, with a minimum of 68 mm. and up to (at least) 92 mm. Therefore the northern forms may be called *Paradigalla brevicauda brevicauda* and the southern ones *Paradigalla brevicauda intermedia* until more material becomes available for further consideration.

MACGREGOR'S BIRD

Plate VII, Fig. 3

An entirely different bird with facial wattles was found by Macgregor's collector, A. Guilianetti, on the highest parts of the Mt. Scratchley Range, at 11-12,000 feet altitude. It was generally black with a cinnamon wing band, with a long rounded tail, a short bill and longer legs. The facial adornment consisted of a large rounded lappet behind the eye. It is obviously no relation of the other wattled bird, and due to its black plumage its relationship is at present very obscure. Unfortunately the plumage is blackish at all stages, as the young in the nest is dusky blackish brown, and therefore there is no clue through the plumage changes.

It should be transferred from here to the "False Birds of Paradise" section, as there seems no real reason for its being called a Bird of Paradise. No notes were taken of its habits at its first occurrence, and little was known about it until very recently, when the American Archbold Expeditions found it at the same great heights, and Rand has furnished a complete account from which the following notes are extracted: "Is a forest bird, and in east New Guinea it favours especially Podocarpus forests, and when in that habitat feeds exclusively on their fruit. But when the coniferous forests were left behind it continued at the higher altitudes to be a fairly common breeding bird. Feeding and perching in the ends of branches,

not being shy, and having a noisy flight all made it easy to find. Its orange wattle helps to make it easy to see when perched quietly in a tree, but there was a commonly flowering tree orchid whose orange bloom matched the wattle of this bird and sometimes caused momentary confusion. These birds were usually in couples even when not breeding. It was an active bird, continually hopping about through the tree tops, or flying from tree to tree; even when not moving it was continually flitting wings and tail. Its flight usually consisted of a dozen or so heavy strokes and then a short glide on outspread wings. The wing strokes give a heavy rustling, audible for a considerable distance, and the glide a loud continued 'zing-g-g-g.' This noise can be modified considerably, particularly noticeable with mating and nesting birds. These birds feed by hopping about the ends of branches, peering among the leafy tips for the fruit. Sometimes they poke among the moss on tree trunks, and pull off moss and bark as though searching for insects, but all the stomachs I have examined contained only fruit. When in forests where Podocarpus occurred, the stomach contents consisted of their fruit exclusively. It has two calls, a low sharp 'klik' or a 'click-click' repeated a number of times, and a low plaintive 'queee,' neither possessing much volume, and both chiefly used when mat-

ing. Sometimes they give a wheezy 'cheu.' This species is monogamous, the male accompanying the female on her nest-building trips, on her trips in search of food when she leaves the eggs she is incubating, and he helps to feed the young. But the male does not establish a territory. Six birds were seen to indulge in sexual flight in the area in which a nest was found in construction six days later, and during three days of observation during the construction of this nest, seven to eight birds in all were giving their sexual flight in the immediate vicinity of the nest, sometimes as close as twenty yards to it. The building bird and her mate consorted amicably with these others. During incubation I saw the male of the pair indulge in a sexual flight with another bird within 100 yards of the nest. This was the only intruder of this species I saw near the nest during the incubation period. There was no attempt to drive this bird away, it being a rather deliberate sexual flight. At the nest, where both male and female were feeding young, no other *Macgregoria* was seen in the vicinity. While this indicates there is no territory in this species, it is interesting to note that at the nest with a fairly fresh egg the male sometimes drove away big honeyeaters and crested starlings that were fifty yards or more from the nest. Also when the birds had young.

"The display of this species consisted of a 'chase' or 'sexual flight' in which usually only two or occasionally three birds took part. Sometimes six to eight congregated in a small area 100 yards or so across for displaying, but then they usually broke up into units of two for indulging in the chase. Both males and females took part in these chases; on one occasion, when four couples were chasing, one couple collected proved to be both males; at others females were concerned. The case was not an attempt by one bird

to drive another from an area. The chase was characterised by frequent rests, during which the birds feed and preen amicably together. On one occasion I saw two males start to chase and a female join in and follow through the chase. Sometimes the chase appeared initiated by the leading bird flying a short distance to another perch and giving a low plaintive 'queee,' an invitation to start the chase by following it. This invitation was frequently accepted. Apparently the female alone builds the nest, though the male accompanies her on her trips with material. Also the female does all the incubation, the male staying in the vicinity and sometimes joining her when she leaves the nest to feed. The male neither fed the female while she was sitting nor brooded, but he fed the young much more often than the female. Nest sanitation was apparently carried out by both birds, as when I collected the nest it was very clean and unsoiled. The nest is a bulky, fairly firm cup structure, composed of coarse moss mixed with woody stems, inside of slenderer stems, and the lining still more slender stems closely bound together with leaves, situated about 35-50 feet high in small forks. The nests were found in August and only one egg was laid. In the nestling, perhaps twelve days old, the eyes not open, but the bird was feathering, the primaries breaking their sheaths, the wattle was well developed. The plumage was dull black, and the remaining down was of a sooty black colour. The egg was earthy pink sparsely marked with spots of light brown, well distributed over the egg, but more common about the larger end, slightly rough and with little gloss."

The separation of Macgregor's Bird as a distinct genus *Macgregoria* was necessary, as it was unlike any other bird in its wattled face, but there was nothing to suggest any relationship with any Bird of Paradise. The genus may be described

thus: Medium-sized bird, with very soft feathering, bill not very long, straight, large, fleshy, wattle, subcircular, behind eye, wings long and rounded, tail rather long, legs and feet long and stout. The coloration is uniform black, save a broad wing bar of cinnamon. The bill is straight, culmen semi-keeled, a little curved, laterally compressed but widening basally, nasal groove short, approaching feathering almost hiding linear nostrils, tip a little decurved and posteriorly notched; under mandible broadening at base, interramal area triangular, short, feathered, feathers short, gonys long, straight. A large subcircular fleshy growth begins round eye and increases behind, but does not appear in front, peculiar to this bird. Feathers of the back are very long and soft, with very long downy after-shaft. The wing is long and rounded, the feathers narrow and pointed, the first primary long, the second equal to the eighth, the intervening ones subequal, the fifth and sixth slightly the longest, scalloped basally on outer edges, the secondaries long and broad, almost as long as the primaries, and inner secondaries about same length, the feathers of the rump less dense than those of the back. The tail is composed of broad feathers, long and slightly rounded. The legs long and strong, the front showing broad scutation, the back smooth for half-way, but the anterior half reticulately scaled; the toes long and slender, the middle toe longest, only slightly

tied to the outer, the inner free but apparently linked with hind toe, which is very stout and long, hind claw very long, and the hind toe and claw equals the mid toe and claw, the front claws also long, the outer and inner toes subequal.

The coloration of the only species, well named *Macgregoria pulchra*, is easily described. The male is black with a broad cinnamon band across the wings. The feathering in front of the facial wattle is dense and the feathers bend forward, the back feathering is also very dense, as is the under feathering. Bill black, iris dull red, feet grey. Bill measurement 22 mm., wing 185 mm., tail 165 mm., tarsus 58 mm. The female is similar, perhaps slightly smaller, with the bill black, eye reddish brown, and the feet light blue. A downy young bird has the eye brown, the bill black and the feet light blue, while it is uniform dusky grey brown, the facial wattle fully formed and only a little smaller, the bill shorter, the wings much smaller, and the tail shorter.

For forty years this species was only known from the high mountains of the south-east, when it was met with in the Snow Mountains, the southern slopes, and very little later it was found on the northern slopes, always at very high altitudes, usually 10,000 feet and over, although it has been recorded from 8,000 feet.

Rand's measurements from the northern slopes of Mt. Wilhelmina read: wings, male 188-200 mm., female 162-179 mm.



LONG-TAILED
BIRD OF PARADISE

(*Astrapia nigra*)

One-third natural size

3
MALE

1
MALE

ROTHSCHILD'S LONGTAIL

(*Astrapia rothschildi*)

One-third natural size

2
FEMALE

4
FEMALE

LONG-TAILED
BIRD OF PARADISE

(*Astrapia nigra*)

One-third natural size



L. and M. 1882

THE LONG TAILS

Subfamily *Astrapiinae*

Plates VIII to X

AS an evolutionary study it would be difficult to surpass the Long Tails, as so many apparent stages are in existence, and though each is clearly distinguished, imperfect knowledge recently led one writer to regard the series as one superspecies. He was misled by the idea that each one represented the other geographically, and therefore could be regarded as counters to play with, not as natural animals ungoverned by fictional hypotheses. While their history is long and intriguing and not yet well-known, the variation is somewhat extensive in every direction. Firstly, examine their name feature, the Long Tail. In the original species discovered some two hundred years ago the male (the sex captured by the bird hunters) was black with a very long tail, and did not appear in scientific literature until included by Latham in his Synopsis, and named by Gmelin and also by Latham himself. Since when, apparently on account of a very restricted habitat, little has been added to our knowledge. One hundred years passed before any other Long Tail was discovered, and then it was a very different bird from the other end of the island. It still had a long tail, however, but ten years later, in the west near the original place, a third was found, but this time it was still more distinct, having a comparatively short tail, but with greatly increased brilliance in coloration. Another ten years passed, and still another different species turned up, more like the first one, but in a restricted locality on the north coast. More recently, in the last twenty-five years, more intense collecting has shown that the species had wider distribution than supposed, and also

that there may be still something extraordinary to be brought to light in New Guinea. For three forms were named from distinct localities, and then an eye-opener providing a first class sensation was found. It was still a Long Tail, but what a tail it was! It has been named the Ribbon Tail, and deserves the name, for the central tail feathers have elongated beyond that of any other bird in a state of nature, being three times the length of the bird. They are narrowed, and while the rest of the bird has remained of the normal dark coloration, these feathers have become white, although retaining a dark tip. Apparently other forms have still to be discovered, as tail feathers unlike those known have been seen, and it was the recognition of the tail feathers that led to the discovery of the Ribbon Tail, which only inhabits a very small area in the district where it lives at present. The evolution of the Long Tails provides an interesting speculative study, as the branching is very diverse, in the above case showing extraordinary tail development without much body variance either in structure or colour-scheme. The opposite is seen in the beautiful little bird called *splendidissima*, wherein the tail is comparatively very short, while the structure is little altered, but the coloration is wonderfully brightened, so that while the pattern is similar the bird has really earned its name. The general scheme of the original Long Tail may be outlined for comparison. It is a large dark-coloured bird with a short straight bill and very long wedge-shaped tail of broad feathers; the head is glossed with blue, the nape green of long feath-

ers, but the throat has a shield of soft black feathers edged with a golden red border, while there is a lower breast shield, extending almost to the abdomen, of dull green edged with shining blue green, and in addition the ear coverts are enlarged into erectile tufts; the feathers of the back, wings and tail are black glossed with purple, more noticeable on the central feathers of the tail, whose feathers are broad, square-tipped and normally flat. As above noted, this bird lived in the mountains of the Arfak district at a high elevation. Little is known about the life history of the Long Tail, the earliest notes by Beccari and Guillemard having had little added to them, as may be supposed. Beccari wrote: "*Epimachus maximus* (the Sickie Bill) and *Astrapia gularis* (the Long Tail) are only found on the highest and most difficult peaks of Mount Arfak, nearly always above 6,000 feet elevation. Specimens in dark plumage (females and juveniles) are common enough; but those which have attained perfect plumage are rare, perhaps because they take some years to acquire it. Both of them live on the fruits of certain *Pandanaceae*, and especi-

ally on those of the *Freycinetiae*, which are epiphytons on the trunks of trees. The irides of the large *Epimachus* are dark brick-red, those of the *Astrapia* almost black; the neck feathers of the latter are erectable, and expand into a magnificent collar round the head. The first day I went out at Atam, on June 23, I got both these species (two specimens of each), besides one *Drepanornis albertisi*, three *Paradigalla*, one *Parotia*, and several other wonderful kinds of birds. It was a memorable day, because I ascended one of the peaks, and was surprised to find myself surrounded by four or five species of *Vaccinium* and *Rhododendron*; I also found an Umbellifer (a *Drymis*) and various other plants common to the mountains of Java, and there were also some mosses a foot and a half in height."

Guillemard stated: "The natives say that they do not think that this bird is really less abundant than the *Epimachus*, although so few skins are ever obtained. They are found in the same district as the latter bird, and, like it, frequent the tops of high trees, but are very silent. Native name 'Haroma.'"

ROTHSCHILD'S LONG TAIL

Plate VIII, Figs 1 and 2

Carl Wahnes ventured into the Rawlinson Mountains of the Huon Peninsula and secured some novelties, amongst which was a new Long Tail. At that time, some forty years ago, only two Long Tails were known, the typical one from the Arfak area and the aberrant "Stephanie" from the south-east. The collection was brought by Professor Foerster to Tring, the home of the Rothschild Museum, and two birds were so outstanding that they were described by Foerster and Rothschild in a small two-page pamphlet, issued quickly in the format of Rothschild's Journal, entitled "Two new Birds of Paradise". One

of them was a different Six-plumed Bird of Paradise which had only four plumes present and was named after the collector and credited to Rothschild; the other was the new Long Tail, and this was named after Rothschild by Foerster. The small pamphlet is not now available, but Rothschild himself wrote: "Adult male. Similar to *A. nigra*, but the metallic border to the breast shield is more fiery-red and only reaches to the upper edge of the shield, not, as in *A. nigra*, to below the eye. The postocular black fan-shaped tufts of *A. nigra* are absent in the present species. The lunated flank feathers have a narrow

subterminal metallic coppery band, followed by a terminal green one, not a broader, entirely green terminal band as in *A. nigra*. The feathers on the hind neck and lower nape appear duller in colour, each feather having a subterminal glittering green band followed by a terminal band of purplish bronze, while in *A. nigra* these feathers have a broad terminal band of glittering green. Breast shield, head, and throat glossed with bright greenish steel blue instead of purple. Wing 182-191 mm., tail 430-485 mm., culmen 38-39 mm., metatarsus 44-46 mm. Adult female. Similar to *A. nigra*, but more black in colour, and the breast more extensively barred with vermiculate pale bars. Wing 166 mm., tail 250-290 mm., culmen 38-39

mm., metatarsus 43-45 mm. Habitat Rawlinson Mt., German New Guinea (Wahnes Coll). Note.—It will strike many that I am inconsistent in not treating *Astrapia rothschildi* and *A. stephaniae* as subspecies of *A. nigra*, but the structure of the plumage of the males is different, and though they undoubtedly represent one another geographically, I do not feel justified in uniting them as three subspecies."

Specimens have since been collected in the Saruwaged Mountains, also in the Huon Peninsula, by Mayr at an altitude between 5,000 to 7,000 feet, and it was merely stated that the habits were similar to those of the other members of the Long Tail series.

THE MOST SPLENDID LONG TAIL

Plate x, Figs. 3 and 4

This most splendid bird is an anomalous Long Tail, as the tail though long is comparatively short, the shortest of the series. But as to its coloration it certainly merits its appellation, as following the general style, each colour is heightened and brightened, and was the first bird found showing white markings on the tail, a feature to become famous in the history of the Long Tails.

The bill is longer than in the larger birds, with a prominent and extensive chin and throat tuft of dark green feathers, bounded by an edging of bright reddish amethyst, and succeeded by a broad band of a duller shade, which is edged by a brighter tone, then a lower breast of silky green, with side edgings of bright glittering feathers, the abdomen also silky green; the top of the head is bright metallic emerald green, and this continues as a tippet on to the upper back, the lower back is black shot with purple, the wings and tail are brown, but the basal half of the tail feathers is white, the feathers flat.

Rothschild named this bird as a species of *Astrapia* with the name *splendidissima*, but it was so different in many features that Sharpe introduced a genus *Calastropia* for it alone, and a detailed account of the generic characters is here appended. The bird is smaller than any other of the Long Tails, with a longer straight bill, a huge chin and throat tuft and puff, metallic head feathers extending into a cape, medium wings, long tail, short comparably, of flat feathers, with short stout legs and feet. The bill is longer than the head, straight, rather stout, laterally compressed, culmen semi-keeled, tip a little decurved and posteriorly notched, nasal groove small, frontal feathers approaching so that the nostrils are almost completely hidden, the interramal space small, tufted, gonys long, almost straight, sub-keeled. Wing feathers all pointed, the first about half the third, which is a little longer than the second, this and the first with sharp apices, but a little shorter than the fourth, which is subequal with the

fifth and sixth, these three being the longest, but the seventh is little less, longer than the third, the secondaries long and broad, round-ended and nearly equalling the primaries. The feathers on the lower back and rump are very long and thick, inclining to disintegrate. Tail feathers rather narrow (for the group) and flat, forming a regular wedge, the external pair very short, all the ends rounded. The legs are short and stout, front clearly scutate, back bilaminate, smooth, save anteriorly where a few scales and scutes may be seen; feet stout, claws long and curved, the mid toe longest, the outer longer than the inner, the hind toe long and stout, third claw longest, hind toe and claw about equal to the middle toe and claw.

The coloration of the male is brilliant, the top of the head, back of neck and shoulders consisting of glittering metallic oily green, the head feathers very small and appressed, the back of the head feathers larger and the cape feathers rather broad, with square cut ends, and while glittering, none of them is scale-like. The back feathers are velvety black with a dark purplish sheen which is lost on the lower back and rump. The wing feathers are dark brown with scarcely any sheen. The ends of the tail feathers are blackish brown, the basal portion creamy white, this colour extending about two-thirds on the central pair, about half on the next pair and successively shorter outwards, so that the underside shows almost uniform blackish brown. Underneath there is a throat patch of puffed out feathers, including the chin tuft of black with an oily green tinge, and surrounded by a narrow band of pale amethyst, which reaches round to the lower angle of the eyes. Below this is a band of richer amethyst, a very lovely shade, and this has an edging of brighter golden amethyst separating it from the remainder of the under-surface, which is rich grass green. On the sides

of the neck there is a remnant of side puffs of velvet black. On each side of the lower breast is a row of metallic-edged feathers which tend to reach each other across the top of the abdomen, but fail to do so. The eye dark brown, the bill black, and the legs and feet also black.

The measurements of the bill from exposed base 34 mm., from nasal groove 23 mm., wing 133 mm., tail 195 mm., tarsus 38 mm. The locality was "said to have come from the foot of the Charles Louis Mountains in Dutch New Guinea", but recently it has been suggested that this and many other species had been collected in the Weyland Mountains. On this account Mayr separated birds secured at Mt. Goliath, Orange Range, by A. S. Meek as a subspecies *A.s. helios*, writing: "Larger than *splendidissima*; throat more bluish green; crown, neck, and dorsal collar more bluish green, less golden green; throat collar more golden red. The spatula on the central tail feathers is wider. Upper parts of females and young males more brownish, particularly on lower back and rump." A series had been measured by Hartert with others collected in the Weyland Mountains by Stein as males with wing 131-136 mm., females 128-131 mm., who added: "In the juvenile plumage the whole of the underside is covered with indistinct greyish white bands."

Rand reports that the expedition to the northern slopes of Mt. Wilhelmina found it common between 7,000 and 9,000 ft., rarer up to 11,000, and one seen above; the males measured in the wing 136-142 mm., the females 129-137 mm. (average 134.6 mm.). The adult males compare well with the type of *helios*, with a slight tendency toward *splendidissima*. The females and immature males differ from six Mt. Goliath birds (collected in 1911) in being more blackish on the upper parts. In this character they are similar to Weyland Mountain skins collected in 1930.

However, skins collected in the Weyland Mountains in 1920 and earlier are browner than fresher material, showing that this character changes with the age of the

specimen. Very few adult males were seen. Of fifteen stomachs examined, twelve contained fruit, one a lizard, one a frog, and two insect remains.

PRINCESS STEPHANIE'S BIRD OF PARADISE

Plate IX, Figs. 1 and 2

The beautiful Long Tail named in honour of the then Crown Princess of Austria is generally known by her name, and it is a lovely bird to be thus associated, though very few now could recall who the lady was. The Blue Bird was named after her husband, Rudolph, who is well remembered on account of his "suicide" at Mayerling, a tragedy that upset the routine of the Hapsburg dynasty, to be followed by the assassination at Sarajevo and the apparent extinction of the nine hundred years old ruling family in Middle Europe. Back to the "Stephanie", as it is commonly called, an aberrant type of the Long Tails, which, differing little in bodily form and coloration, has developed an unmistakable form of long tail. Compared with the original Long Tail, this bird has the ornamentation of the head and neck less developed, the double shields of the under-surface less pronounced, the fiery margin missing; the middle tail feathers are very elongate, and the broad webs recurve so as to produce a concave surface almost ending in a spout.

The pioneers of the south-east, first the missionaries, then the traders, followed by the collectors, had to make haste very slowly on account of the fighting natives, and today it is astonishing to read of the early collectors penetrating into the savage wilds "twelve miles distant from the coast" at Port Moresby. Then the adventurous Hunstein, who later paid with his life for his venturesomeness, pushed inwards to the mountains, and was well rewarded by the discovery of the Blue Bird,

the smaller Sickle Bill, and the present glorious Bird of Paradise. The Blue Bird was, of course, the most spectacular in every way, but this bird is one of the handsomest of the series, and it alone would have been worthwhile the undertaking.

When Finsch and Meyer described *Astrarchia stephanie*, they explained: "It is especially the form of the tail that gives us the opportunity of separating this new species generically, inasmuch as the subdivision of the Paradise-birds into genera has now-a-days been carried to so great an extent, whether rightly or wrongly we need not at the present moment inquire. The webs of the two central tail-feathers (about 10 centimetres broad and 64 long) are arched upwards towards one another so as to form a sort of open channel; towards the ends their edges approach so near one another as to constitute a broadened pipe; the webs of the lateral feathers are similarly turned up, but to a lesser extent. While the tail of *Astrapia nigra* is regularly graduated, in that of *Astrarchia* the graduation is irregular. But besides this, the deviations from *Astrapia* are so numerous that the generic separation can be well substantiated. In *Astrarchia stephanie* the lengthened feathers of the chin are wanting, and the feathers of the neck-shield are not curved upwards, but smooth and recumbent. Besides, in *Astrarchia* the large lateral head plumes are wanting, although the corresponding feathers are somewhat elongated. Again, the metallic band from the eye down the neck to the breast and the

PRINCESS STEPHANIE'S
BIRD OF PARADISE

(*Astrarchia stephaniae*)

One-third natural size

1
MALE

RIBBON-TAIL
BIRD OF PARADISE

(*Taeniaparadisea mayeri*)

One-third natural size

3
MALE

RIBBON-TAIL
BIRD OF PARADISE

(*Taeniaparadisea mayeri*)

One-third natural size

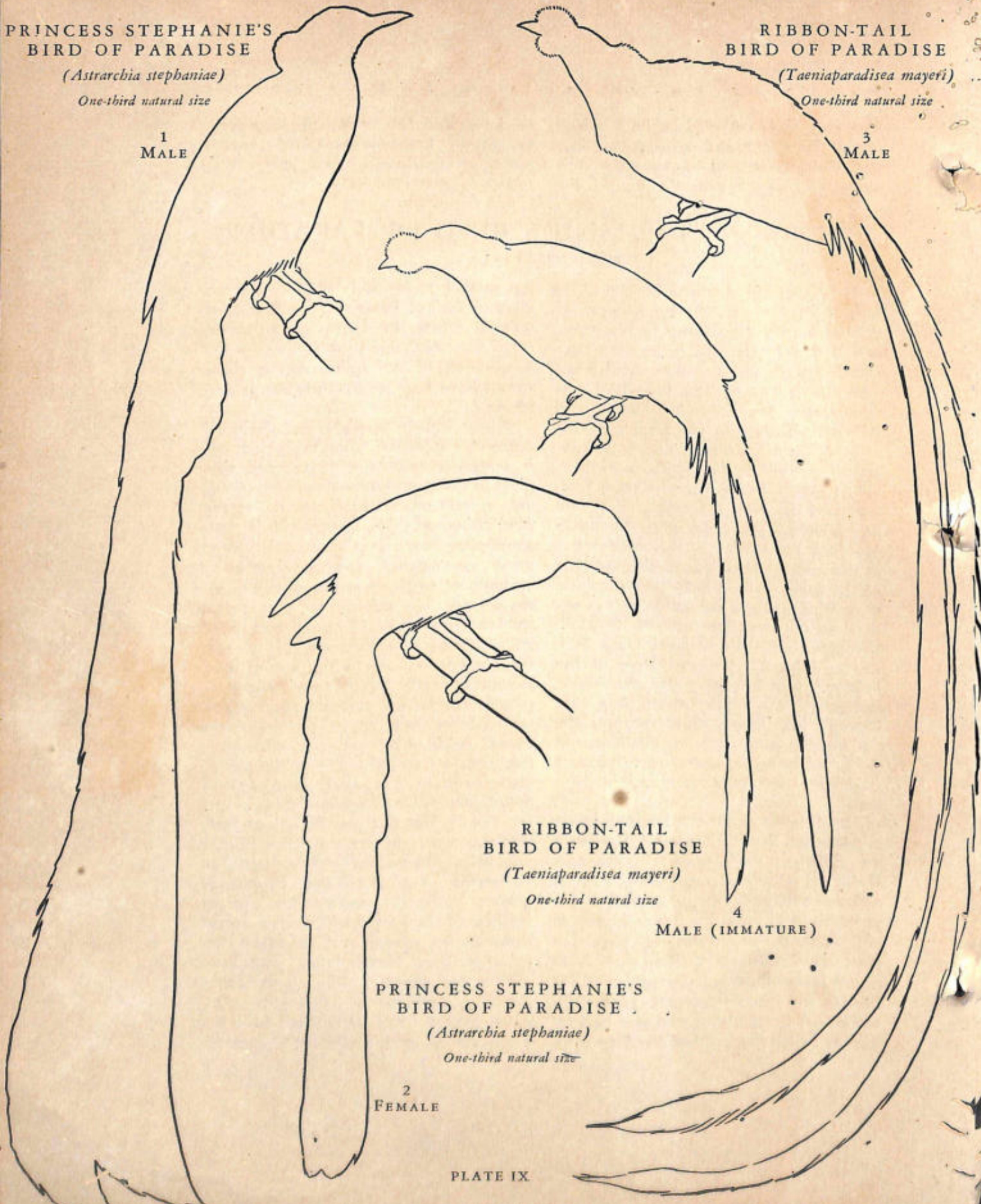
4
MALE (IMMATURE)

PRINCESS STEPHANIE'S
BIRD OF PARADISE

(*Astrarchia stephaniae*)

One-third natural size

2
FEMALE





Island Melane

green band at the back of the neck are both absent, besides which there are other minor differences in coloration, which it is not necessary to enumerate. We have only the male of this species," De Vis described the female: "Above blackish brown tinged with rufous brown except on the head, wings, and tail. Head, face, ear coverts and chin nearly black. Throat and upper breast blackish brown, the latter circumscribed. Remainder of lower surface subcaudals, and underwing coverts with alternate bars of blackish brown and buffy yellow, the latter broader. Base of shafts of middle tail feathers white. Bill, legs and feet black. Length 510 mm., tail 340 mm., wing 153 mm., bill 28 mm., tarsus 37 mm. The two middle tail feathers concave on the upper side of the apical half." Male measurements: Total length 840 mm., wing 156 mm., tail 640 mm., bill 25 mm., tarsus 41 mm.

The genus *Astrarchia* is here described for later comparison. The bill is almost as long as the head, straight, culmen slightly arched, tip a little decurved, sharp, with a marked posterior notch, the nasal groove completely covered with soft, small, velvety feathers, concealing the nostrils, head flat, under mandible straight, interramal space small, weakly feathered, no chin tuft, gonys long. The head and back of the head are covered with glittering feathers, but not scale-like, feathers of the upper back very full, but sides of neck not puffed out at all. The wing feathers all medium and pointed, the first, half the longest, which may be the fourth or fifth or sixth, which are subequal, the seventh and eighth only slightly less, the second about equal to the secondaries, which are medium broad and round tipped, decreasing successively inward. The tail is wedge shaped, the outer feather very short, say 50 mm., the next 20 mm. longer, the next 20 mm. longer still, the next, say 30 mm., the next 40 mm. longer,

making the innermost one of the five about 160 mm.; these are all medium broad only, innermost 30 mm. broad, all rounded tipped with small pointed apex. Then the central pair broadens out and elongates up to 600 odd mm., the width near base being 50 mm., soon increasing to 70 mm. or so, the edges upturning on each side to form a concave broad V, which narrows deeply towards the tip. The legs are medium and stout, with broad scutes in front and bilaminate behind; toes strong with medium claws, the middle toe longest with longest claw, the outermost shortest with shortest claw, the hind toe very long and stout, the hind claw longest and stoutest.

The coloration of *Astrarchia stephaniae* is superficially black, but the glittering head feathers are bluish green merging into purplish on the nape; in front of the eye there is a golden green patch, and behind green becoming purple on the ear coverts, the back is tinged with bronze, the back of the neck with a purplish sheen, the lower back brownish black, the wing feathers blackish brown, the tail feathers, save the central pair, which are glossed with purple and have the basal shafts narrow and white, are dull blackish brown, the chin and breast feathers are shining, closely packed, square cut feathers, succeeded by a broad velvet black band, edged with reddish copper, rest of the under-surface brown with bronze sheen, flank feathers not lengthened at all, under wing black. The bill is black, eye brown, and feet black. Measurements of male bill from nostril 22 mm., wing 166 mm., tail 160 mm., long central tail feathers 610 mm., tarsus 45 mm.

The female has been described above: "Above blackish brown tinged with rufous, that shade missing from the head, wings and tail; throat and upper breast blackish brown, next of under-surface

barred blackish brown and broader buffy yellow. The two middle feathers concave on the upper side of the apical half, measuring 340 mm." It is important to read that description, in view of the fact that Neumann named a subspecies *feminina*, from the Schraderberg, from females which were much darker above, black, not dark olive brown, and tail 350 mm. without any difference noted. Later Mayr named another subspecies from the Herzog Mts. *ducalis*, but he had a male which

differed only in the blue violet sheen of the upper side of the central tail feather, not purple. The female was even darker than the *feminina* and apparently of the same structure, as only colour differences were remarked upon, particularly the coloration of the barred lower under-surface. Attention is drawn to these items, as Mayr later seemed to regard *feminina* as the female of the wonderful Ribbon Tail, an impossible association from the descriptions as discussed under that species.

BARNES'S LONG TAILED BIRD

Plate x, Fig. 1

This beautiful relation of the Stephanie was secured by Captain N. B. Blood in the Mt. Hagen district, and could be very near to Neumann's *feminina* if the faunas of Mt. Hagen and the Schraderberg were very similar, which has yet to be proved. It is a beautiful male, and therefore might have a female of the *stephaniae* type which is yet to be seen. The distinguishing feature is the white marking on the elongated tail feathers, a character not yet recorded in *stephaniae*. If this were the only difference it might have been disregarded, but many other differences have been noted and will here be explained.

At first sight it could claim relationship with "Stephanie" and the Ribbon Tail, and even be regarded as the result of a mesalliance between the two, were it not for the fact that the former is missing in the district. On the other hand, it suggests a stage in the evolution of the Ribbon Tail which has not yet been eliminated, but has managed to survive alongside its more brilliant relation. The bird can be best described by comparison with *stephaniae* already fully detailed; the bill is shorter, more slender, there is a slight tuft on the nostrils, and the chin feathers are full and semi-tufted; the head feathers are

similar in coloration but more scale-like, while the nape feathers almost form a metallic frill; the throat patch is similar in coloration but smaller, while the succeeding "black band" has become a secondary breast shield, more than twice as broad and with a more marked, broader, brighter edging of copper, the remainder of the under-surface is also more brightly bronzed. The wing structure is much the same, but the tail is somewhat different, the short tail feathers being shorter and narrower, more pointed, and the long ones longer and also narrower. The shortest, outermost, feather is about 55 mm. long, next 10 mm., next 10 mm., next 15 mm., next 30 mm., 120 mm. in all, the innermost about 20 mm. broad. The central pair is very long, about 750 mm. long, and narrowed basally with broad white shafts, continuing narrow for the first 100 mm., then broadening gradually and upturning like the feathers of *stephaniae*, but at the broadest only about 40 mm. across. The purple sheen is duller and less marked, and there are extensive white markings along the basal half of the tail. Bill and feet black. The bill measures from nostril 15 mm., wing 160 mm., tail 120 mm., central pair 750 mm., tarsus 42 mm.

THE RIBBON TAIL

Plate IX, Figs. 3 and 4; Plate XIII, Figs. 2 and 3

This is the latest development in this group as to the elongation of the tail, which is three times the length of the head and body, a proportion unsurpassed in any bird in nature.

The bird itself recalls in some ways the original Long Tail, in others the Stephanie, but differs in its huge nasal tuft almost concealing the bill, and in its pointed tail feathers, which are comparatively short save for the middle pair, which are disproportionately long and narrow. It is now a matter of history that the tail feathers were known before the bird which produced them was brought to Australia.

Apparently the first note of the bird is that by Hides, who met with it on Mount Champion, and a specimen was shot by one of the native police and the tail feathers kept, but nothing happened to bring them before the scientific world. Then F. Shaw Mayer met members of Hides' party, who told him of the discovery, and Mayer kept looking for the bird and managed to secure a pair of the long tail feathers from a missionary who had procured them about ten miles west of Mt. Hagen. They were being worn by a native as a head-dress. These were sent by Mayer to the British Museum (Natural History) and a report was received that they certainly belonged to a new Bird of Paradise, and asked for specimens. Before Mayer could get an opportunity, three birds were collected by a Hagen-Sepik patrol under Messrs. Taylor and Black, and sent down to the Australian Museum through the Administrator, Sir W. R. McNicoll. The birds were as surprising as the tail streamers had suggested, and as noted above, showed another step forward in the tail evolution of the Long Tails. Kinghorn

determined the bird as a new genus, which he named *Taeniaparadisea macnicolli* being given specifically in honour of the Administrator's assistance. Taylor supplied the following information, all that is known of its life: "This bird was observed in the forested range of the main cordillera west and north-west of Mt. Hagen, between longitude 143 degrees 30 minutes east and 142 degrees 30 minutes east on both sides of the Strickland (Fly) Juat (Sepik) watershed. It is probable that the bird will be found further west in the Star Mountains of Dutch New Guinea. The species appears to be confined to altitudes between 8,000 and 10,000 feet above sea level, and is more numerous at 9,000 feet than at any other height. There are not many of them, but one meets them here and there in the high forest. They make a clicking or hammering sound, something like a pneumatic riveter at work, and appear to have some difficulty in flying, the long tails being an encumbrance. Their flight is slow and jerky, and over short distances only. In display they jump from branch to branch, raising the tail slightly. The female, speaking from memory, is light brown in colour with a shorter tail. The local people (natives) know the bird as Yaka Yan-gi, yaka meaning bird." However, in its very short life the species has struck trouble as regards its correct name. For before Kinghorn had described the bird, a worker at the British Museum (Natural History) had given a scientific name to the tail feathers alone, a reprehensible affair. The name must be upheld, although bestowed upon it in such a left-handed manner, and the only bright part is that the author selected the name of the conscientious field worker, F. Shaw Mayer.

GREEN-BREASTED
SICKLE BILL

(*Astrapimachus astrapioides*)

One-fourth natural size

2

3
MALE

MOST SPLENDID LONGTAIL

(*Calastropia splendidissima*)

One-fourth natural size

4
FEMALE

BARNES'
LONG-TAILED BIRD OF PARADISE

(*Astrarchia barnesi*)

One-fourth natural size

1
MALE



Lilias H. 1842

Almost worse still was to happen, but fortunately it has become a comedy rather than a tragedy. Many years before, Neumann, a fine ornithologist, but with no local knowledge, named some New Guinea birds collected by a German expedition along the Sepik, and therein recognised some females of an *Astrarchia* and separated these as a subspecies, calling it *feminina* on account of its darker, almost black, upper coloration. The known forms of the Stephanie show that the male and female are very little different in size, with a wing length of 150 mm. to 160 mm., and the females described by Neumann had had wings measuring 148 mm. to 152 mm., from the Schraderberg.

Although Kinghorn had referred to the pointed tail feathers, a feature quite unlike that of the Stephanie, and given the wing measurements as 175-177 mm. and that female was probably light brown, Mayr boldly stated that the *Taeniaparadisea* was the unknown male of Neumann's *feminina*, and without any valid reason boldly displaced both Kinghorn's and Stonor's names by *feminina* in his published List. Such action by such a well-known worker puzzled many who were unable to read the facts, but the remedy soon came to hand.

Captain N. B. Blood was on patrol during the late war and entered the restricted territory of the Ribbon Tail, of which he knew from his friend Taylor above mentioned. He therefore secured additional specimens for the Australian Museum, and at the end of the war he again ventured into the country to secure the necessary female. He achieved his object and the bird is here figured, so that there can be no more doubt about the inconsequent action of Mayr. Blood fortunately secured a series including female, young male and adult, so that all is now clear.

Kinghorn's generic description of his *Taeniaparadisea* reads: "Bill straight, normal and as in *Astrapia* and *Pseudastrapia*, but the culmen is only 25 mm. in length. The feathering of the forehead extends on to the culmen, forming a dense tuft of velvet pile. Exposed portion of culmen only 10 mm. in length. Tail graduated, the rectrices with sharp-pointed triangular tips. In the male the two central rectrices are extremely long and narrow, being ribbon-like and three times as long as the head and body. These rectrices are white with a black and pointed tip."

A more detailed description of *Taeniaparadisea* here follows: The bill may be of normal to small size, but only the tip shows, the base and nostrils being hidden by a large puff of feathers succeeded by the crown of the head being covered with very small glittering green, more golden than bluish, extending with the same colour on to the nape; the back feathers are full and black with a slight bronzy sheen, the lower back dull black, the wing feathers deep brown, as are the tail feathers except the central pair. The bill is straight, culmen arched, tip decurved, sharp, posteriorly notched, interramal space short, feathered, gonys not very long, straight. The wing has the first primary rather short and pointed, short, less than half the length of the third, the seventh longest, the sixth and eighth subequal and a little shorter, the third and tenth subequal and equalled by the outermost secondaries; the primaries are medium, sharply pointed, the secondaries broad and round tipped, decreasing regularly inwards. The tail is very short, save the central pair, which is extraordinarily elongated, and the feathers pointed sharply, the central pair narrow all their length, but upcurved after the first 100 mm. or so, extending some 900 mm., tips narrow. The legs are medium, strong, scutate in front, bilamin-

ate behind, mid toe longest of anterior, outer longer than inner, claws sharp, hind toe very long and stout, claw very stout, so hind toe and claw greatly exceeds middle toe and claw. The only species *T. mayeri* has the bill and general coloration as above; there is a large ear puff which, beginning with green, follows with deep purple, the feathers rather scale-like, then puffing into black velvet with a faint purple sheen. The throat patch is large, bright green from the interramal space, there is no sign of a chin tuft, the feathers glittering but not scale-like, and broadening and square cut at the ends; then follows a medium sized band of velvety black with a very slight bronze tinge, succeeded by a narrow edging of bright copper, the rest of the under-surface blackish brown, the upper feathers with bronzy edges, the lower less bronzy, under tail coverts black. The central tail feathers are white with medium white shafts to the last 30 mm., which are brown, the tip sharply pointed. The bill from tuft 11 mm., wing 175 mm., tail 120 mm., central pair 900 mm., tarsus 42 mm. The female has the frontal tuft not quite so pronounced, the crown of the head glittering oily green, from the nape to the middle of the back thick black feathering with a strong purple sheen, lower back, rump and upper tail coverts brownish black, wings dark brown, tail feathers brown, the two centre ones with broad white markings both sides of the dark shaft to near the end, which is brown. The cheeks are green, only a slight tinge of purple near back; the chin without any sign of chin tuft is deep oily greenish, while the throat and breast are black with deep purple as on the upper back; the

abdomen is dull black with a few remains of pale bands on lower flank feathers; the under wing coverts are black. The measurements of this bird are: bill from nasal tuft 15 mm., wing 170 mm., tail 170 mm., central pair 300 mm., tarsus 40 mm. The young male is different, as fortunately a young bird was secured in the change; this shows the adult plumage in all except the tail, which retains one old brown central tail feather and one new white one. The other tail feathers are short as in the adult male, whereas in the female as above the tail feathers are longer. An immature female with a young scaly bill shows the nasal groove before any tuft has developed and the nostrils as long linear operculate slits, the exposed bill measuring 18 mm. The crown of the head is black with a green shimmer, the back of the head and nape with a deep purplish gloss, the back to the upper tail coverts brownish, the former with a purplish black sheen, the latter paler brown; the tail feathers brown, the bases of the middle pair white, the tips sharply pointed, as are all the other feathers of the tail; wing feathers deep brown; underneath the chin, throat and chest black with deep greenish and purple reflections; the abdomen feathers are black cross-banded with broad rufous bars, which extend on to the under tail coverts, the under wing coverts are similarly marked. In this stage it might be comparable with the female of *stephaniae*, but the tail differs; the proportions of the tail feathers agree thus, the outer pair about 110 mm., next 120 mm., next 130 mm., next 140 mm., and pair next to central 170 mm., central pair 340 mm., breadth 15-20 mm.

ABERRANT LONG TAILS

Even as there was a series of Aberrant Rifle Birds which has been regarded as composed of hybrids of this, that and the other, so there is a number of very beautiful Long Tails which has been similarly stigmatised. Another five or so species have been resolved into their component parts, with the result that the Wattled bird is supposed to have paired with the Superb, the Six-plumed and the Sickle Bill, while the Sickle Bill has been accused of forgetting its glorious dignity to pair with the Long Tail. While the latter birds are both majestic and perhaps worthy of each other's notice, the peculiar little Wattled bird does not deserve recognition in such a matter. The formation of facial wattles and gape wattles has occurred independently in many groups of birds, and has little phylogenetic significance unless confirmed by colour scheme and other structural features. Hence the slight lobing of the gape does not indicate any

relationship with the Wattled bird, whose facial wattles are of different formation entirely. In the search for the parents of these supposed hybrids some unlikely guesses have been made, and sometimes the first apparent suggestion has been continued without thought. In the case of Elliot's Bird, the birds concerned are thought to be the Sickle Bill and the Long Tail, and for the somewhat different Green-breasted Sickle Bill the same combination has been put forward, the excuse for the differences being that in one case the male parent may have been a Sickle Bill, in the other a Long Tail. Against this confusion is the other view that Elliot's was once referred to the Lobe Bill series, supposed to have originated from the Sickle Bill and the Wattled bird. Probably as unlikely as any other, as these birds would scarcely breed even under unnatural force in aviaries.

ELLIOT'S BIRD OF PARADISE

Plate XI, Fig. 2

One of the finest and one of the most puzzling of the Long Tail or Sickle Bill series was described before the Zoological Society of London in October, 1873, by Edward Ward, who said: "About the end of September last I received from Singapore a collection of New Guinea birds, amongst which was a skin of a new species of the Paradiseine group. I have the pleasure of exhibiting this bird to the meeting. It is evidently a male specimen in full plumage; and I propose for it the name *Epimachus ellioti*. This species differs from the Grand promerops (*E. magnus*) of Cuvier (of which I exhibit two specimens for comparison) in several respects. It is about one third less in size; and instead of being bluish green on the

back and tail, the head, wings and tail of this bird are beautifully illuminated with an amethyst colour; the plumage is also much thicker and more velvety in texture, probably even more so than in any other species of the whole group. The breast is greenish, and on the chest is a line of indefinite tertiary shades. A line of steel-blue crosses the pectoral plumes, which are otherwise of a deep black. The back in this species is of a plain amethyst shade, and is not marked with spots as in *E. magnus*. The upper mandible is 2 inches long; the entire length from beak to end of tail 22 inches; whereas *E. magnus* is often 40 inches. The two gorgeous central feathers of *E. ellioti* measure 16 inches. Tail feathers twelve in number as in *E.*

magnus. It is a custom of the natives of New Guinea to dismember their birds when preparing the skins; and in this specimen the legs and primary feathers are wanting. In general form this bird resembles *E. magnus*. Of the haunts and habits of this bird I regret to say I cannot at present learn anything. The unique specimen referred to in this paper has been added to Mr. Gould's splendid collection, and will, I believe, be figured in his forthcoming work 'The Birds of New Guinea.' An illustration of this bird by Mr. Wolf will appear in Elliot's 'Birds of Paradise.'"

This account was not published until April, 1874, and in the meanwhile Elliot had issued the illustration cited, and thus his work becomes the first reference to the bird named in his honour. Little else was known until Meyer in 1890 added the following information: "A male from north-west New Guinea, without more exact locality. This is the first complete specimen known, as the type was a defective native skin, also without locality. Elliot's plate is quite wrong, Gould's much better, though neither are exact, as the following details show:—The green colour of the flank plumes, belly and base of the ornamental breast plumes is darker,

as well as the violet of the breast, which latter colour shades slowly into the green of the belly; the throat is metallic green, shading into violet laterally; the metallic margins of the ornamental sickle-shaped breast plumes are broader on the lower ones (up to 4 mm.), narrower on the upper, and entirely wanting on the outermost; all are much narrower underneath; the tail underneath is darker; the shape of the tail is concave; the violet of the back and wing-coverts is less vivid than on the plate. As no exact measurements of the male are known, I add the following:—Bill 41 mm., wing 202 mm., tail 403 mm., tarsus 50 mm., longest ornamental breast plumes 125 mm., longest flank plumes 190 mm. The female of the species is unknown."

It was at one time suggested that the home of this glorious species might be Waigiou, as a Sickle Bill had been reported from that island. It was overlooked that a specimen of the Waigiou Sickle Bill had been procured by Labillardiere, and apparently brought back to France. The specimen in that case would have been available to the French naturalists who recorded the locality in connection with the great Sickle Bill.

GREEN-BREASTED SICKLE BILL

Plate x, Fig. 2

This curious bird was described by Rothschild as *Epimachus astrapioides*, that is, the Sickle Bill like a Long Tail, and as nothing much has since been learnt about it, this description is here given: Head and upper neck brilliant metallic purple. A bare spot behind the eye. Back and rump brownish black, some feathers tipped with metallic greenish blue. Tail black; central tail feathers one third longer than the second pair, and shining steel-blue glossed with purple. Wings

black, outer webs with steel-blue reflections. Chin and throat blackish-purple, lower neck metallic coppery red, fading into shining coppery green on the breast. Abdomen green, the basal half of each feather being black. Flank feathers long, extending beyond the wings, green fading into a coppery olive green and mixed with some large scale-like feathers, purple with metallic blue borders. Side plumes short, metallic purple, tipped with brilliant peacock metallic blue. Total length 830 mm.,

wing 185 mm., tail 595 mm., tarsus 50 mm. Dutch New Guinea. Sharpe commented thus: "This species has been described by the Hon. Walter Rothschild, who has given to it the very appropriate name of *astrapioides*. It is certainly wonderfully like an *Astrapia* in plumage, but is, of course, by reason of its sickle-shaped bill, a member of the genus *Epimachus*. The steel-green gloss on the wings and tail feathers is a mark of affinity with *E. speciosus* and *E. meyeri*, and the spangles on the back are also metallic green and not purple as in *E. ellioti*. Although there is a slight purplish shade under certain lights in *E. astrapioides*, there is

nothing like the prevailing purple colour seen in *E. ellioti*. The present species is entirely different below from the three other species, for it has a glossy purplish black throat, followed by a bronzy red gorget which merges into the coppery green of the fore-neck and breast, the abdomen and flank feathers being more of a grass-green. The long fan-shaped plumes on the side of the fore-neck are also different from those of *E. speciosus*, having a distinct shade of coppery purple before the bright steel blue at the end of these feathers. The crown of the head and the hind-neck are purple, the latter with a shade of metallic copper and oily-green."

THE NOBLE LOBE-BILL

Plate xi, Fig. 3

On account of the lobes at the base of the bill, Rothschild, who was very shy otherwise in the proposition of new genera, introduced *Loborhamphus*: "This new genus shows some very complex characters, combining most of the peculiarities of *Lamprothorax* with the tail of an *Astrapia*. The most distinguishing character, however, is the unique arrangement of two yellow fleshy folds on the basal third of the bill, forming two short wattles on each side. The beard on the chin and the feathering at the base of the bill and nostrils as in *Lamprothorax*. Pectoral shield as in *Lamprothorax*, but the lateral pectoral tufts are longer and more curved, similar to those of *Falcinellus*. The nuchal fold is much less developed than in *Lamprothorax*." The specific name selected was *nobilis*. "Adult male crown purple; neck, back and rump velvety black, with a bronze gloss. Wings and tail black, with a purple sheen on the exposed webs. Sides of neck and head coppery bronze. Chin and throat dark bronzy green. Pectoral shield glittering purple, with metallic blue reflexions. Some of the feathers of the lateral tufts have a metallic blue

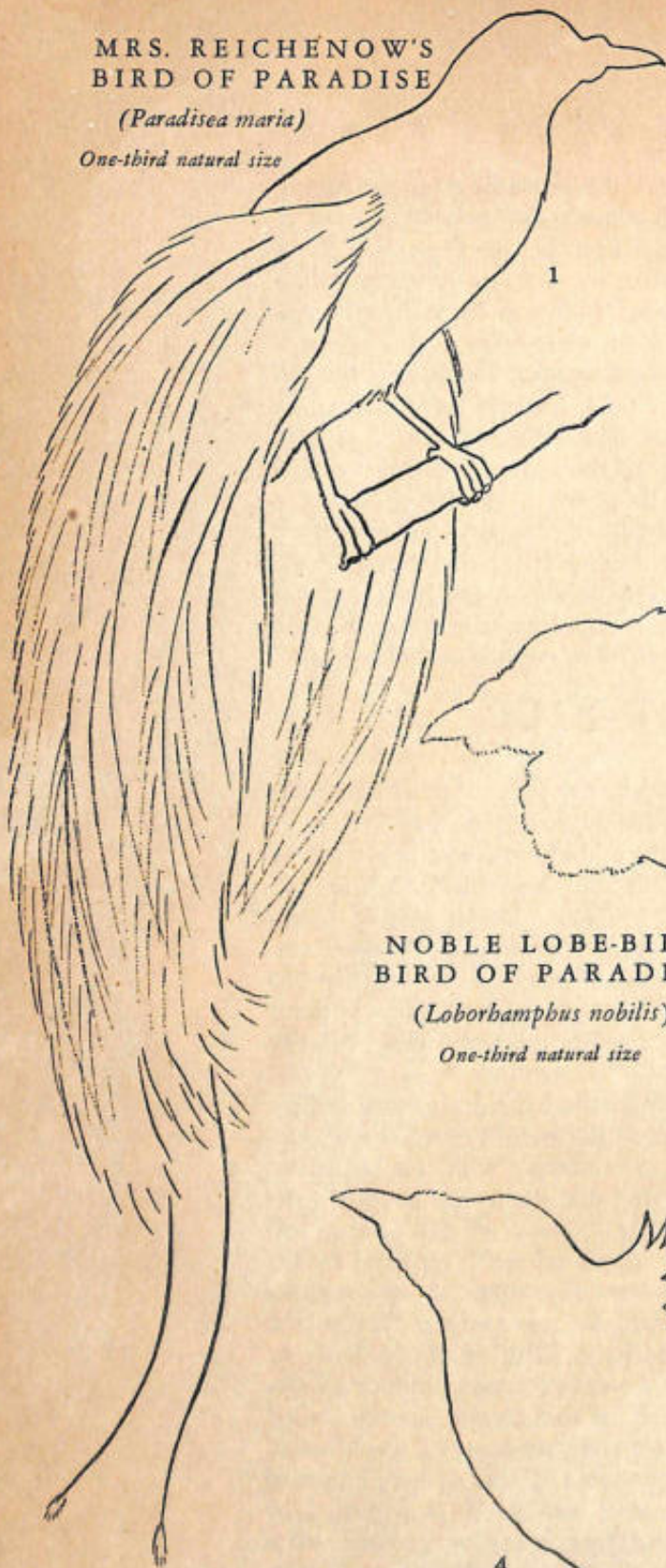
border. Below the pectoral shield is an ill-defined wide bronze-green band. Rest of under-surface black with a strong wash of purple. Bill and legs black. Wing 165 mm., tail 154 mm., lateral pair of feathers 105 mm., bill from gape 37 mm., culmen 32 mm., rostrum from nostrils 215 mm., tarsus 44 mm. Dutch New Guinea, but exact locality unknown from M. van Renesse van Duivenbode."

A study in the hybrid phantasy is here presented, as Rothschild noted that it suggested *Lamprothorax* with the tail of an *Astrapia*, and that the lateral pectoral tufts were similar to those of *Falcinellus*. All these are dismissed to be replaced by the simple co-operation of *Lophorina superba* and *Paradigalla carunculata*, that is, the Superb and the Wattled Birds. Such an intercourse would scarcely produce a long-tailed bird, as the former is short-tailed and the apparent tendency of the Wattled Bird is to short tail also. It may be noted the *Lamprothorax* itself is regarded by the hybrid lovers as the product of a mating of the Superb and the Magnificent, the latter a bird of no close relationship and very unlikely to mate.

MRS. REICHENOW'S
BIRD OF PARADISE

(*Paradisea maria*)

One-third natural size



ELLIOT'S
BIRD OF PARADISE

(*Astrapimachus ellioti*)

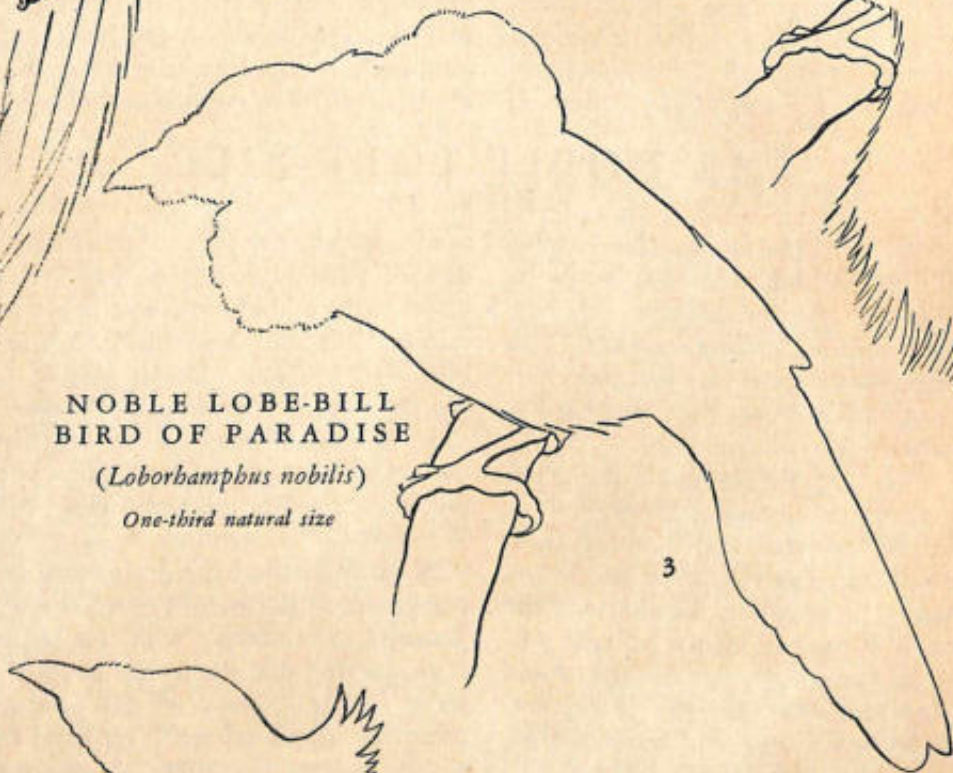
One-third natural size



NOBLE LOBE-BILL
BIRD OF PARADISE

(*Loborhamphus nobilis*)

One-third natural size



WILHELMINA'S RIFLE BIRD

(*Lamprothorax wilhelminae*)

One-half natural size



Lilian Hodgkins

SHARPE'S LOBE-BILL

Plate xiv, Fig. 4

The bird that Sharpe described as *Loborhamphus ptilorhis* has not yet been figured, but through the kind assistance of my friend Mr. N. B. Kinnear, now Director of the British Museum (Natural History) an illustration of the type is here presented from a painting by Miss R. G. Talbot-Kelly. Sharpe's description reads: "Velvety black, strongly washed with coppery purple, top of the head metallic, a little paler, but otherwise uniform with the back; nasal plumes thick and velvety; sides of face same colour as the crown; chin oily green, the pectoral shield more or less iridescent reddish purple, but some feathers margined with steel green; rest of under-surface velvety black; the flank feathers elongated black; bill and feet black; adorned at the base of the bill with a yellow fleshy lobe. Total length about 13.5 inches (= 333 mm.), culmen 1.3 inches (= 33 mm.), wing 7.1 inches (= 180 mm.), tail 6.2 inches (= 157 mm.), tarsus 2.1 inches (= 53 mm.). Hab. said to be Dutch New Guinea. Received from Mr. G. K. Dunstall. Obs. This new species is larger than *L. nobilis*, one

of the typical specimens of which has been brought for comparison from the Tring Museum, by Prof. Oscar Neumann. It differs further in having a gloss of reddish-purple over the back and wings. There is not any sign of steel-blue on the crown, as in *L. nobilis*. The sides of face and ear coverts are also of a purplish-copper, not of an oily green, as in *L. nobilis*. The shield on the throat and fore-neck shows much more metallic steel-green than in the smaller species."

Little more than the preceding is known, and this bird appears in the hybrid lists as being the product of a union between *Paradigalla carunculata* and *Parotia sefilata*. Apparently no details of the structure have been published, and the painting shows a rather stout bill, not much like that of *Paradigalla* or *Parotia*, the frontal puff and fleshy gape also recalling neither, while the breast shield shows no resemblance to that of *Parotia*; the tail suggests the long tail of *Paradigalla carunculata*, but that means less than nothing when the short tailed forms of *Paradigalla* are recalled.

THE FALSE-LOBED LONG TAIL

Plate xiv, Fig. 1

Another new genus introduced by Rothschild was *Pseudastrapia*, thus: "This new genus has the middle rectrices sharply pointed and elongate as in the genus *Falcinellus* (*Epimachus* of former authors). The bill is almost straight, as in *Astrapia*, *Loborhamphus* and other genera, and not long and sickle shaped; the feathering of the forehead is continued along the bill and conceals the nostrils, and, as in the genus *Loborhamphus*, there is a curious light-coloured fleshy lobe above and below the angle of the mouth." The sole species

was described from "Immature male? General colour dull black, the forehead with a bottle-green gloss; the elongate middle rectrices with a steel-blue gloss, especially on the outer webs. Bill and feet black, the fleshy lobes at the base of the bill light coloured. Culmen 42 mm., wing 187 mm., middle pair of rectrices 395 mm., lateral pair of rectrices 122 mm., metatarsus 46 mm. Dutch New Guinea."

He added: "I have received a second specimen of *Loborhamphus nobilis*, and *Janthothorax mirabilis*. The type of the

latter had lost the middle pair of rectrices, but these are present in this specimen; they were only 27 mm. longer than the other tail feathers and of a purplish blue colour glossed with greenish."

Later he added a "Note. On re-examining the type of *P. ellioti* I found that it had the short almost straight bill and

the wattled gape of *Pseudastrapia* as well as the shorter and stiffer tail, and so it must be taken out of the genus *Falcinellus* and placed in the above-mentioned genus."

The parentage of this species suggested by the hybrid-discoverers is the Sickle Bill and the Wattled Bird, but this seems most improbable from the illustration.

THE SICKLE BILLS

Subfamily *Epimachinae*

Plate XII, Fig. 3; Plate XIII, Fig. 1

PERHAPS the most magnificent in its true sense of all the Birds of Paradise, the Sickle Bill demands admiration from every aspect. The Sickle Bill attracts attention and has been responsible for the wandering of the bird in the classificatory sense. When first met with it was placed alongside other sickle-billed birds such as the Hoopoes, and the South African Wood-Hoopoes, two very different groups. The New Guinea species was granted even then pride of place, as the trivial names selected were *magna*, *maximum*, *speciosa*, *superba* and *fastuosus*, all indicating size and special beauty. In addition to its sickle bill the bird was black with metallic sheen on its head and throat; but also, which no other bird possesses, a row of large metallic-like iridescent feathers down the back. Then the tail was very long, but the feathers were rather sharply pointed, thus adding to its attractiveness. However, for display purposes, there were two sets of glorious feathers, a breast set and a flank set, and these were of quaint shape and design as well as lustrous and delicate. It is impossible to paint the beauty of this bird in words, as the vocabulary needed would rival that of the cinema advertisement writer, and such would demean the hauteur of this bird's appearance. It was well figured for the time by Sonnerat in black and white, and its female, which is a modest bird, was figured at the same time as a distinct species. It inhabited the same restricted locality as the original Long Tail, and like it no relations appeared for a century; when a drab (in comparison) relative was discovered

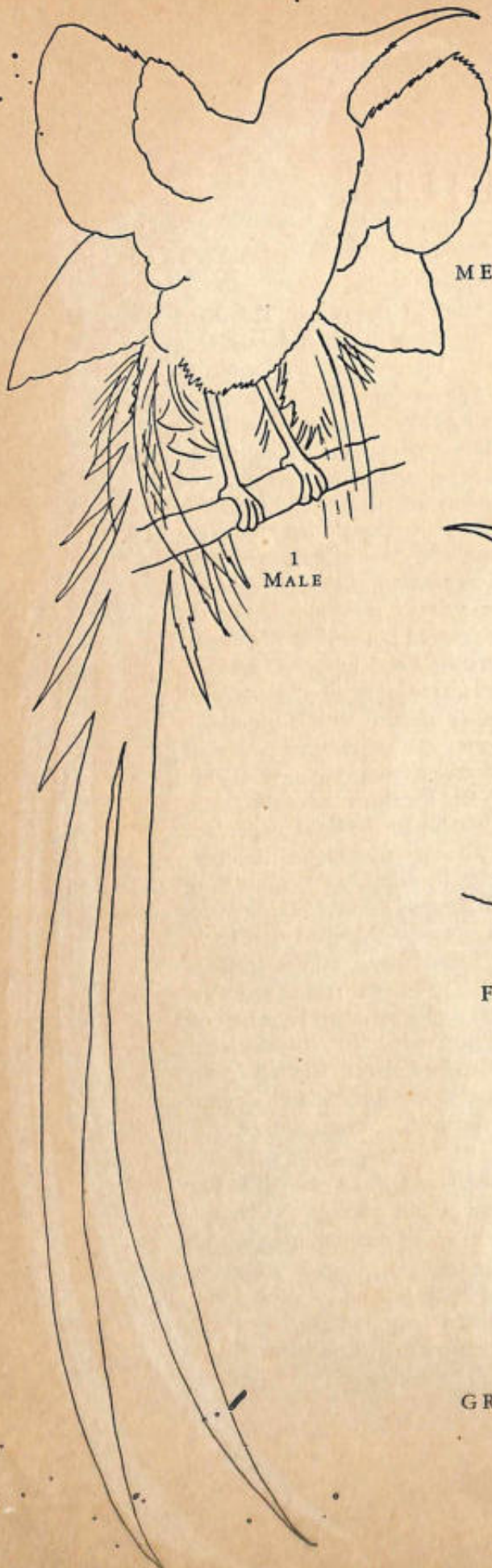
in the far south of the island. This lived alongside the Long Tail, and was at a later period, by undiscerning students, ranked only as a subspecies.

The genus *Epimachus* is very well separated by the combination; a long sickle-bill with medium wings, very long tail of pointed feathers, strong legs and feet. The long curved bill is strongly laterally compressed, stout and deep at base with very little basal expansion, although so compressed the culmen is rounded, the tip short, not decurved but with a slight posterior notch; the nasal groove is covered with feathers save a small oblique oval semi-operculate nostril with a small interior process; the interramal space is small and feathered showing a small chin tufting, this and the throat have the feathers velvety; the top of the head, nape, face and cheeks are covered with soft feathers showing metallic-like tips, simulating scales, while there is a row of large scale-like metallic feathers down the back. There is no breast shield, all the feathers soft and velvety, but there is a series of pectoral fans and also another series of flank fans succeeded by disintegrated plumes as described above. The tail feathers are long, fairly broad and dagger pointed at the ends, a long wedge, the central pair twice as long as the next, the outermost pair only about one fifth the length of the middle pair in the typical form. The legs are of medium length, and strong, the front almost smooth, scutation obsolete, the back bilaminate; the front toes are not very long, but the claws are quite long, the outer a little longer than

MEYER'S SICKLE BILL

(*Epimachus meyeri*)

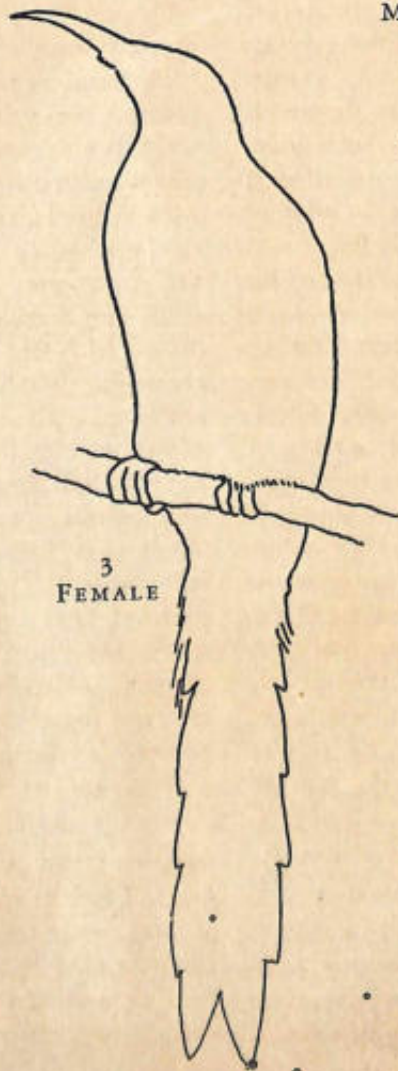
One-fourth natural size



1
MALE

2
MALE

2
MALE



3
FEMALE

GREATER SICKLE BILL

(*Epimachus fastuosus*)

One-fourth natural size



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the inner, the mid toe equalling the inner toes and claw, but the hind toe is long and stout, the claw large and powerful, the hind toe and claw exceeding in length the middle toe and claw. The female is a much smaller bird with a shorter bill, wing, legs and tail and no ornamental fans. Instead of the long tail feathers being more than three times the length of the wing, the tail in the female is less than twice the wing length.

In coloration *Epimachus fastuosus* the general upper coloration is generally black above and deep brown below, but the bird here described and figured is even larger and black below with minor details of coloration elsewhere. The bill and legs are black; the head feathers velvety black with shining metallic tips of blue green merging into purple on the nape and especially purplish on the face and cheeks, the chin and upper throat velvet black with a purplish sheen; the feathers of the back are also velvet black with a purple shimmer on the shoulders, rump and upper tail coverts. Down the middle of the back there is a row of feathers about six across with long metallic tips, the uppermost tips measuring about 5 mm., the middlemost 15 mm., the lowest 25 mm., with 8 to 10 mm. in width of deep bluish green, the primaries and tail are blackish, the primary edges purple tinged, the inner secondaries with purple sheen; the tail feathers are also glossed with purple, less noticeable on the outer feathers. The pectoral and flank fans defy description, as the feathers are so peculiarly shaped and lie in series varying in shape to fit into a complete fan when extended. The longest uppermost have the shafts curving downward, and the web on the lower side is very narrow, disappearing terminally, while on the upper side it increases in length and in a straight edge and with a straight cut termination, this series is all velvety black; the second series is simi-

lar in form, but shorter and with a broad purplish blue terminal band; a third series is shorter still, but of the same form and with a broad terminal band of green with a slight purplish base. These will be called Upper 1, 2, 3 series and comprise the pectoral fans, which are erectile above the head. But the flank fans are even more curious, as they also are arranged in three series, but are succeeded by a fourth series of disintegrated long narrow plumes. The feathers are somewhat similar in form at first but lengthen out so that the first series of four feathers is placed one below the other, and each has an iridescent terminal band of green with blue bases; the second series has the feathers further apart from each other and more disintegrated tips, and narrower, the terminal band being bluish with green tips, while in the lowest series the feathers are much longer and narrower, dagger-like, disintegrating further and the terminal band much longer and practically all blue with a faint greenish tinge only. These will be called Lower 1, 2, 3 series, and though these ornaments have not before been detailed for use they appear to be of value to the specialist in distinguishing the subspecific forms. The tail is strongly wedge-shaped, composed of broad, sharp-pointed feathers, the edges upcurved so that the feather is broadly V-shaped; the proportions of the feathers vary, a purplish sheen being seen in the present case, but typically more bluish. The measurements also vary; those of the bird above described being: bill—chord of curve 68 mm., depth at base 11 mm., wing 220 mm.; tail—longest feathers 830 mm. by 45 mm. in width, next 460, 300, 240, 190 mm., and shortest outer feathers 160 mm., tarsus 60 mm.

The female has the same hooked bill, the crown of the head reddish brown flecked with darker, back more olive, the rump paler and the upper tail coverts pale

RIBBON-TAIL
BIRD OF PARADISE

(*Taeniaparadisea mayeri*)

Two-fifths natural size

2
MALE
(IMMATURE)

GREATER SICKLE BILL

(*Epimachus fastuosus*)

One-fourth natural size

1
MALE

3
RIBBON-TAIL
FEMALE

Two-fifths natural size

4
MALE (IMMATURE)

CAROL SIX-PLUMED BIRD OF PARADISE

(*Parotia carolae*)

Two-fifths natural size



olive, the tail feathers reddish olive, the throat blackish brown, upper chest whitish tips, the succeeding feathers closely barred with black and whitish, bands a little broader towards the under tail coverts, where the bars are almost equal; the under wing coverts similarly barred and the inner wing lining rufous, bill chord 67 mm., wing 165 mm., tail 280 mm., tarsus 50 mm. The immature males are said to be similar to the females but larger. The eye in the male is red, female red brown, bill black, legs grey.

Eliminating *meyeri* and its subspecies for the moment, Rothschild and Hartert separated a form from Mt. Goliath 5,000 ft., collected by Meek, as being black not deep brown on the under-surface, and the tips of the lower ornamental side plumes steel blue instead of bronzy green; the bill bigger and thicker, especially in the females which had the upper surface, especially the tail, less rufous, but the crown darker rufous. Ogilvie-Grant with Uttakwa River birds admitted that the under parts were deep black with a dark green gloss, the typical form being sooty brown with a faint purplish gloss. But he

said he could not see any difference in the tips of the lower ornamental plumes and that the tail (in moult!) might be shorter. The subspecific name selected was *atratus*, and Stresemann recorded it from the Schraderberg, giving measurements as follows: Bill, male 62-66.5 mm., immature male 61-65 mm., adult females 63.5-72 mm.; wing, males 210-222 mm., immature males 184-202 mm., adult females 175-182 mm.; tail, males 810-840, 940 mm., immature males 370-418 mm., adult females 289-325 mm. Later Hartert separated the Schraderberg form as *stresemanni*, pointing out that the measurements given by Stresemann showed it to be larger than a series of *atratus* from Mt. Goliath, Weyland Mts. and Wandammen, which measured in the males, wing 190-198 mm., and in the females 156 to 170 mm.

The bird above described and figured was collected by Captain N. B. Blood at Lake Hoiyevia, 5,500 ft., west of Mt. Hagen, and is nearest to *stresemanni* in size, but nothing is known of the details of the coloration of the tips of the fans of the latter.

MEYER'S SICKLE BILL

Plate XII, Figs. 1 and 2

When dealing with birds from such an extensive and unknown country it is wrong to twist the facts to suit theories, and the present bird is an "awful example". A large Sickle Bill had been known from the North-West of New Guinea for about a century when a smaller similar bird was described from the South-East. It differed in many points, and there should have been no doubt whatever as to its distinction. But when the obsession of geographical forms flooded the brains of some of the best workers, all the facts were minimised in order to make the birds

fit into the zoological jigsaw, and it was triumphantly concluded that these two were merely subspecies, representing each other at each end of the great island. Upon comparison it seemed obvious that this was wrong, but the theory overruled the facts until more knowledge of the range of the forms was gained, and the intervening miles were brought together by the discovery of forms of the two extremes living together, and proving the differences first observed were of the value first granted them. Now not only are the two species allowed to be distinct, but

RUYS'
BIRD OF PARADISE

(*Neoparadisea ruysi*)

Two-fifths natural size

2

FALSE-LOBED
LONGTAIL

(*Pseudastrapia lobata*)

One-half natural size

1

LONELY
LITTLE KING

(*Cicinnurus lyogyrus*)

Three-fifths natural size

3

SHARPE'S LOBE-BILL

(*Loboptiloris ptilorhis*)

Three-fifths natural size

4

PARADISE CROW

(*Lycocorax pyrrhopterus*)

Two-fifths natural size

5

MALE



Linnæus

more than one subspecies is admitted to each species.

As has so often occurred in this group, the female was described first and the male afterward, in this case each receiving a name, but of course the first name must be used, which is that of *meyeri*. Meyer was so interested in this group that it is a worthy bird to bear his name, especially now when all the doubts as to its validity have been swept away. As its larger relation is the most beautiful, or better, magnificent of all the Birds of Paradise, this species can bask in its refulgence as it cannot match it in brilliancy, although it shares its many attractive points.

When Hunstein plunged into the mountains of South-East New Guinea he did not get to a very high altitude, but managed to secure a female bird which Finsch and Meyer described as *Epimachus meyeri*, pointing out: "Of this species we have only a female, which, however, is easily distinguished from the female of the allied *E. speciosus* by its more olive-coloured upper-surface, by the want of the rusty-red colour on the wings, by the brighter reddish-brown of the head, which is also extended on to the nape, by the scale-like appearance of the head, and lastly, by the fine undulations of the whole under-surface. The bright cross stripes are more olive-yellow than in *E. speciosus*; the under-surface of the wings is uniform blackish grey with scarcely brighter margins instead of the reddish-brown inner webs of *E. speciosus*, and the tail has no reddish tinge. The bill is but slightly longer than in *E. speciosus*, but considerably more compressed and less curved. That this is not the unknown female of *E. ellioti* Ward, is evident from the length of the bill (73 mm.), which in *E. ellioti* is 50 mm. This is besides unlikely on other grounds. In *E. speciosus* the bill is about the same length in both sexes. It is evident that the unknown male

of *E. meyeri* will probably be found to differ in not unimportant points from *E. speciosus*."

Ramsay a little later described a new species as *Epimachus macleayanae*, basing it upon a male collected in the same area, and it was obviously very distinct, as Finsch and Meyer had suggested, from the western bird in size and coloration and especially in the longer thinner bill. Thereupon De Vis reported *E. meyeri* from Musgrave Range, 6,000-9,000 feet: "Four adult males and two young males. The young examples correspond so closely to the type of *E. meyeri*, except in a greater length of bill, that I can hardly doubt the correctness of the opinion entertained by the collectors that these are males of the species named. If so, a description of the male has been given by Dr. Ramsay under the name of *E. macleayanae*."

The display of the smaller Sickle Bill has been shown to vary, probably geographically, and this may apply to many other species, too. Thus, Crandall, of the New York Zoological Society, has recorded two slightly different displays of the same species and also, he concluded, of the same subspecies: "There are two principal forms of display. In one, the body is turned slightly upward, in a nearly horizontal position and broadly flattened. The short flank plumes are spread and purple lights play over the brownish breast, but the general effect is not spectacular. It is the upright form that is really worth waiting for. The bird sits quietly on his perch, calmly preening his plumage. It is then that we see that there are two long pectoral tufts or shields, which ordinarily are kept tucked well out of sight. Now they are held loosely upright, receiving, each in turn, a prolonged arrangement by the long slender bill. All this preparation seems unnecessary, but it is done with definite intent. For at the supreme moment, each feather must fall

perfectly into place. Suddenly, as we watch, the bird stiffens on its perch, flattens its body and throws the pectoral plumes upright above its head. And now we note a remarkable fact. For, while our two birds are known to have come from points within fifty miles of each other in the mountains of South-Eastern New Guinea, and presumably belong to the same subspecies, the climactic forms differ. The first bird, collected in the Central Division of Papua by the Society's expedition, drew his extended shields together and held them upright like two fingers, with at least an inch of space between them. The second bird was taken by Mr. Shaw Mayer near the Waria River, about fifty miles to the north-east. When this bird displays, the shields are broadened to the utmost, so that they join in a wide fan, closely encircling the head. So overpowering is the effect of this spectacle that the most experienced observer, seeing it for the first time, surely would not set down accurately just what had taken place. It was only after we had watched a number of times that we saw that a curious, convulsive movement of the body was causing the short outer tail feathers to open and close alternately, like the leaves of a fan. Here we have two birds, presumably identical, one of which showed what seemed to be a primitive display form that is fully developed in the other. Only extended observation in the field will solve this problem." Legend to an accompanying photograph reads: "Full climax comes when the bird has expanded its plumes to their fullest and flattened its body. Then the long curved beak is opened wide to show the yellow interior of its mouth."

The fact that the localities were only fifty miles apart mean very little when it is realised that one locality is south of the dividing range and the other is north in a different geological area. Examination of bird skins from the two localities will

show that many small but possibly important variations exist. It is a curious commentary on the methods of some of our classifiers that apparently some species are very minutely subdivided while others showing even more distinctive separative features are loosely associated.

The female was described by Finsch and Meyer, and the immature male is similar to a specimen collected by Kowald on the Musgrave Range at 1,500 feet, having the head and back of neck bright rusty red (not streaked), the back brown, the tail paler brown, chin and upper throat pale brown, the feathers black tipped, the rest of the under-surface brown-barred with darker brown throughout. A little older bird shows the plumage of the adult but duller throughout, the breast dark brown, the lower sides with purple flush, the disintegrated plumes brownish straw, the lower fan showing violet reflections while the upper fan shows purple, the tail shot with purple and the head blue-green, the back plates oily green.

Although the essential differences between this species and the original type were well detailed, on account of its belonging to the same genus only, it was degraded to the rank of a geographical subspecies, a matter of rank injustice. But as truth will out it established its distinction in no uncertain manner, as the two species were found living in the same locality, and the distinction became so marked that no one would think of any other relationship. The co-existence of the two forms was first discovered in the south-west, and there may be a slight altitudinal distinction in life. This is not yet proved, but Captain N. B. Blood was fortunate to get the two species in the same area west of Mt. Hagen, the smaller one at 7,850 feet, the larger one at 5,500 feet, but this must not be regarded as the limits of altitudinal range. The contrast of the two species was very marked, the

smaller one appearing brownish, the larger black, but the latter was altogether a bigger, bulkier bird. The feathering of the larger bird was also longer and broader, the ornamentation grander in every detail, the bill as recorded, stouter, and the legs stronger. For instance, the long central tail feathers of the large black bird measured 830 mm. with a breadth of 45 mm., and though the smaller bird's tail was almost as long, 775 mm., the feathers were only 33 mm. broad; but the next pair of the large bird reached 460 mm., while in the smaller bird 270 mm. was the length. The details of the ornamental fans seem to vary also,

as the pectoral fan in the large bird shows very broad tipped feathers in three series of about four or five feathers each; the same number may be seen in the smaller bird, but the feathers are much smaller. But the flank fans show more differences, as in the large bird there are also three series each of four broad feathers, brightly tipped, while in the smaller the feathers are dully tipped, much smaller, and appear more numerous, six in the uppermost, five in the median and five in the lowest series, the succeeding disintegrated plumes also being shorter and weaker. The metallic plaques along the middle of the back are also notably smaller and narrower.

THE RED SICKLE BILLS

Plate xv, Figs. 1 and 2

Always placed alongside the Sickle Bills on account of the curved bills, there can be little doubt that there is no direct relationship between the two, merely a coincidence of the bill formation. Even the two birds, similar in their modest coloration, which have even been placed in the same genus, seem to be really of different origin.

At first glance the origin of the Red Sickle Bill seems tied up with the ancestry of the Little King, but of course it is a long time since their forefathers parted. The Red Sickle is very beautiful in the modesty of its coloration, so that it appears dull and unimpressive until the light shows up the delicacy of its colour scheme. Thus D'Alberty wrote upon his first meeting with it: "This will probably prove to be a new bird, both generically and specifically. It is very rare, and many of the natives did not know it; but others called it 'Quarna.' The peculiarity of this bird consists in the formation of the bill and head, and in the softness of the plumage. At first it does not appear to have the beauty peculiar to other birds of this class;

but when observed more closely and in a strong light, the plumage is seen to be rich and brilliant. The feathers rising from the base of the beak are of a metallic green and reddish copper colour; the feathers of the breast when smooth are of a violet-grey, when raised form a semi-circle round the body, reflecting a rich golden colour. Other violet-grey feathers arise from the flanks, which are edged by a rich metallic violet tint; and when the plumage is entirely expanded, the bird appears as if it had formed two semi-circles around itself, and is very handsome. The tail and wing feathers are yellowish; underneath they are of a darker shade. The head is barely covered with small round feathers, which are rather deficient at the back of the ears; the shoulders are tobacco-colour, and under the throat black blending into olive. The breast is violet-grey, banded by a line of olive, the rest white. The beak is black, eyes chestnut, and the feet of a dark leaden colour. Total length 13 in., wing 6 in., tail, middle feathers 5.5 in., outside 4.4 in., bill to gape 3 in., along curve 3.3 in. The species

was found at about 3,000 feet at Atam, Mount Arfak district. The female was brown above, the tail pale chestnut, the under-surface still paler closely barred with black, the middle of the abdomen and under tail coverts reddish ochre, unmarked, the throat spotted with darker. Its food was not known, as nothing was found in their stomachs."

This bird was named by Sclater *Drepanornis albertisi*, and by a coincidence ten years later he received the south-eastern bird to describe, but at the same time as he described the first one Meyer also described it from the same locality, and apparently Rosenberg also met with it.

The southern form, which Sclater called *cervinicauda*, had been collected by Goldie, but Hunstein met with it a little later and Finsch and Meyer noted "similar to *D. albertisi*, but smaller and paler. The difference in the general size of the two species is not very considerable, but the measurements of the bill and tail are sufficiently different (5 to 10 mm. less) to make their constant variations of importance when accompanied by appreciable diversities in colour. The whole upper-surface in the southern or eastern bird is brighter, the back is more of a yellow olive instead of brownish-olive as in the northern or western bird; the lower back and rump rusty yellow instead of rusty red, the tail pale yellow instead of rusty yellow; the edgings of the inner webs of the tertiaries are like the tail, while in the northern bird the tail is much darker. The reddish-blue sheen of the head, which is so apparent in the western bird, is altogether, or almost altogether, wanting in the eastern one; the tufts of feathers above the eyes are very small and consist only of a few feathers, whereas they are larger in *D. albertisi*; the naked spaces on the back of the head are less extended in the eastern than in the western one; the underside of the tail

in *D. cervinicauda* is not much brighter than in *D. albertisi*, so that there is a much greater contrast between the two surfaces in the latter. Lastly, the inner webs of the inner-surface of the wings are broadly edged with isabelline colour in the eastern bird, whereas in the western one these edgings have a strong brownish tinge. The females are still more different in colour, inasmuch as in *D. albertisi* the whole upper-surface is rusty brown, while in *D. cervinicauda* it is olive with the exception of the tertiaries and the rump, which are rusty brown, but always appreciably brighter than in *D. albertisi*. Again the tail is considerably brighter above, but nearly similar below. The under-surface of the body in *D. cervinicauda* is also rather brighter, and apparently less regularly banded."

The genus *Drepanornis* is one of the most puzzling of all to locate, as it combines a sickle bill with a plumage altogether at discord with that of any other Sickle Bill in its modesty and charming coloration. The bird is of medium size with a long sickle bill, slender, medium wings, rather long wedge tail, short legs and strong feet. As ornaments there are two frontal tufts and two pairs of fans, one pectoral, the other flank. The bill is very long and slender, sickle shaped, upper mandible well decurved, strongly laterally compressed, a little swollen at base, where the nostrils lie in a shallow groove, quite exposed as small oblique apertures; a few small feathers encroach on nasal groove but do not approach nostrils; gape a little swollen, interramal space small, feathered, gonys very long and curved, a small bare space round the eye extending a little behind. The wing has the first primary short, less than half second, which is shorter than the seventh, the fourth to sixth subequal and longest, the fifth maybe slightly exceeding the others, primaries narrow, secondaries rather broad and long.

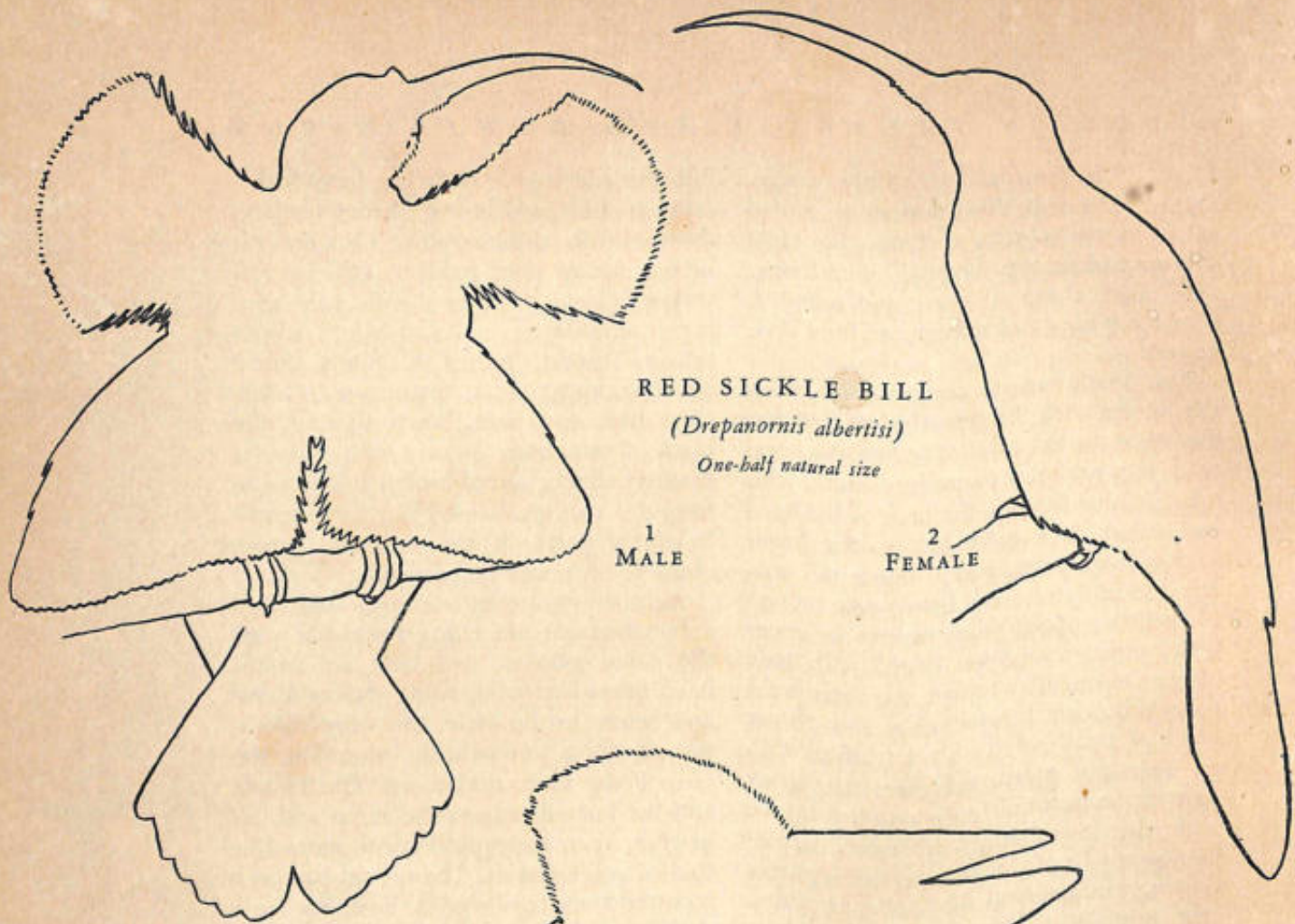
The tail is long and regularly wedge-shaped. The legs short and stout, scuted in front, bilaminate behind, the feet strong, middle toe longest, outer longer than inner, claws all sharp and rounded, hind toe longer and stouter and hind claw largest.

The South-Eastern *cervinicauda* generally agrees with the typical form, but has the top of the head duller brown, the nasal tufts less pronounced velvety black with metallic blue tipping, the back of the head and upper back olive brown, the lower back a little paler, rump, upper tail coverts and tail above and below pale brownish yellow; upper wing coverts as upper back, primaries brown edged with pale brown, secondaries brown, the outer webs pale yellowish brown; chin and throat patch of small velvety black feathers with an iridescent green shimmer; the upper part of the pectoral fan is purplish brown with the lower edge iridescent purple; the lower part of the pectoral fan is purple brown, when spread disclosing an iridescent crimson subterminal band with a shimmering purple terminal band; the flank fan is purple brown with iridescent purple terminal band, feathers as in pectoral fan disintegrating with square cut tips; middle of abdomen white, under wing coverts whitish with brown tips; inner wing lining pale salmon fawn. Bill chord from gape 65 mm., wing 145 mm., tail 130 mm., tarsus 30 mm., bill black, eye red brown, feet lead. The female shows about the same measurements save that the bill may be longer, without ornamental plumes, the nasal tufts normal,

bill, eye and legs brown. The head feathering is short, red brown, throat feathers short, narrow, disintegrating, back reddish brown, rump pale reddish, tail reddish yellow, primaries brown with pale edgings, secondaries paler brown, coverts brown, throat brownish black finely streaked, upper breast feathers with black cross bars and pale brown tipping, the black dominating, breast with broader feathers clearly barred brown and fawn in irregular curving bands, the dark brown becoming paler on abdomen and flanks, obsolete on under tail coverts.

Another subspecies was proposed upon a female from the Huon Peninsula with the name *geisleri*, and later collections have proved it valid, being darker above and below in the male, the wing coloration showing less reddish coloration, the olive being more noticeable. The female and the immature have the rump and tail brighter than the typical form, more like that of *cervinicauda*. The species has been reported from Lordberg in the upper Sepik district, and also from the Herzog Mts., but the material has been insufficient to separate more subspecies, though these are indicated.

One specimen from the Weyland Mountains was, however, sufficient for Rothschild to name a subspecies, *inversa*, as it had the bill shorter with the wing longer than in the typical subspecies; adult males of typical form, wing 148-150 mm., bill 80-85 mm.; adult male of *inversa*, wing 158 mm., bill 74 mm., though an immature male measured wing 156 mm., bill 75 mm.



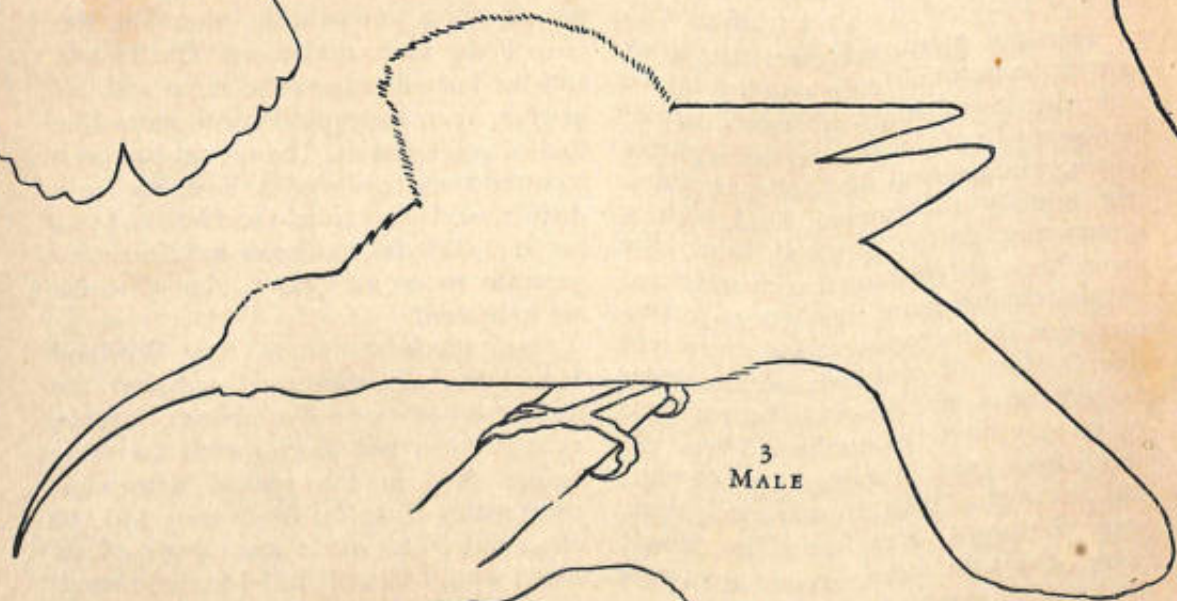
RED SICKLE BILL

(*Drepanornis albertisi*)

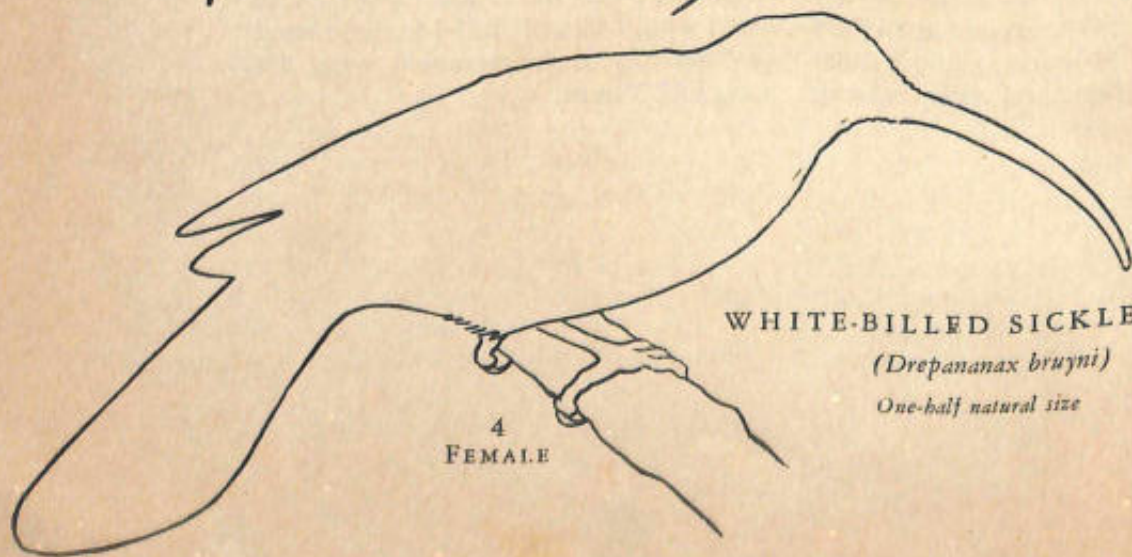
One-half natural size

1
MALE

2
FEMALE



3
MALE



4
FEMALE

WHITE-BILLED SICKLE BILL

(*Drepananax bruyni*)

One-half natural size



Leucophaea

THE WHITE-BILLED SICKLE BILL

Plate xv, Figs. 3 and 4

If this wonderful species had been represented by only one or so specimens the hybrid-enthusiasts would have been troubled to guess at its parentage, and it has most of the factors utilised in the making of the hybrid phantasy. It lives in a somewhat restricted locality and has so many peculiar features that it may not be closely allied to the other species next to which it is now placed. The sickle bill is white, an unusual colour, and quite unlike that of the other Sickle Bills, while its coloration and ornaments also disagree. The head coloration and feather structure differ from those of the preceding, while the bird also lacks the forehead bumps; the pectoral fan is quite unlike that of the Red Sickle Bill, and has more the form of that of the Sickle Bill proper, while there are no flank-fans.

The great collector Bruijn first heard of it and wrote Salvadori about this new *Drepanornis*, and a note was made of the suggestion. Some four years later Bruijn secured a specimen and this was sent home and described by Oustalet. It was a female and Salvadori was doubtful about it, and it was not until males were secured that its distinction was fully acknowledged.

Its history is very short and little is known of its habits. It appears that the first birds secured by Bruijn were all females or young males, so that Guille-mard wrote: "While at Ternate M. Bruijn showed me the skins of two birds of the genus *Drepanornis* obtained by his hunters on the north coast of New Guinea, a little to the eastward of the mouth of the Amberbaki River. One was marked 'female,' the other 'male'; but both were destitute of any brilliant colouring whatsoever. M. Bruijn informed me that his hunters had obtained seven or eight ex-

amples of this species, but that, though of different sexes, they were all of the same sober colouring. Judging from the habits of others of the *Paradiseidae*, notably in the case of *P. rubra*, where the immature males and females appear to live in districts quite apart from the adult male at certain seasons of the year, and from the fact that in this group of birds the males are all of brilliant colouring, we can safely predict that the adult male of this species has yet to be discovered, and that it will probably show a development of subalar plumes closely resembling that of *D. albertisi*."

The adult male was later described and figured by Oustalet, collected by Laglaize, between Geelvink Bay and Humboldt Bay, to which area it seems to be restricted. This showed that it could not be regarded as strictly congeneric with the described species of *Drepanornis*, and Sharpe proposed the generic name *Drepananax* for it, the specific name of Oustalet being *bruyinii*. The bill is long and sickle shaped, ivory white in coloration, and shows the nostril as a small oval in a very small shallow nasal groove and quite free of feathering; it is strongly laterally compressed, slender, but longer and stouter than the bill in *Drepanornis*, which is dark coloured. The head feathers are velvety and soft, with a metallic edging at the sides, the cheeks and throat also velvety. The wings are rather short and the tail rather long and well rounded at the ends. The legs short and stout. An ornamental series of plumes forming into fans develop at each side of the breast, but there are no lower fans on the flanks, merely a series of green-tipped feathers. The general coloration of the male is brown with a reddish tinge, more marked on the lower back to the tail coverts; tail

also brown with reddish outer webs; wing feathers brown edged externally with reddish, the secondaries also showing this colour on the internal edges so that the inner secondaries (tertials) appear all red. The top of the head is black with a purple sheen, the cheeks and throat being similar and glossed with purple shading to bronze; round the eye a large bare spot of blue skin, developed well behind the eyes; the upper breast blackish brown glossed with oily green, the lower breast to the tail coverts dark grey with a lavender sheen. From the sides of the breast a series of feathers forming a mobile fan project of a blackish tinged with green, the tips with blue and a subterminal band

of coppery red; below a row of greenish feathers may be seen, but these do not develop into a fan. Total length area 325 mm., wing 160 mm., tail 110-115 mm., tarsus 34 mm., the bill as above 75-78 mm. The female is slightly smaller in all its measurements, and is similar in the coloration of the head and eye space, but the upper-surface is brown, lacking the reddish tinge on the back, but retaining it on the edges of the feathers of the wings and tail. The whole of the under-surface from the chin to the tail coverts pale buff to buffish white closely and regularly cross-banded with blackish. Of course there are no pectoral ornaments. The immature is like the female.

THE LITTLE KING AND HIS FRIENDS

Subfamily *Cicinnurinae*

Plate xvi; Figs. 3, 4 and 5

HOW the little King gained his Kingship will never be known, as he had earned (?) it before white men touched New Guinea, and the earliest writers recorded his story. A curious story, too, that has not been confirmed by recent observation, yet apparently well believed. Valentyn's account shows his excellent commonsense as, reading Forster's translation: "The last species is the King-bird, which some reckon among the Paradise-birds; but, according to Valentyn, it is totally different from them. Linnaeus and Buffon, however, refer them to the Paradise-birds, chiefly induced by the shape of the bill, and the feathers peculiar to this genus. This bird is about seven inches in length, and somewhat exceeds a titmouse in bulk. Head and eyes (which are surrounded with a black circle) small, beak straight. Crown of the head flame-coloured; nape of the neck blood-coloured, neck and breast chestnut, with a band of bright emerald. Wings large for the body; quill-feathers black, with rays spotted and streaked with shining red. Tail straight, short and brown. Intermediate tail feathers long, thread-shaped, black, exceeding the rest a palm in length, with a lunated feathered tip, of a shining green above, brown below. Belly spotted, from the sides proceed bundles of broad-rayed feathers, one part of the rays green, the other brown. Back blood-brown, glossy like silk. Feet like those of a lark, three toes before, one behind. This bird never associates with the other species of Paradise-birds, but flies about the lonely thickets, wherever it sees red berries, nor ever sits upon tall trees. In Aru it is called Wowi Wowi; in the Papua isles Sopclo-o.

The Dutch name it King's-bird. It is chiefly brought from Aru-Sopclo-o; and especially from Wodjir, a well known town of this island. The Aruans say they have never seen its nest; but suspect that it is a stranger from New Guinea, and there brings up its young, but never leaves Aru during the dry season of the western monsoon. It is taken in snares, made of Gummaty, or with bird lime prepared from the Sukkom or bread-fruit. It is disembowelled and dried, and sold in Banda. The Aruans put it in their helmets in their mock fights, and the game Tobakalil."

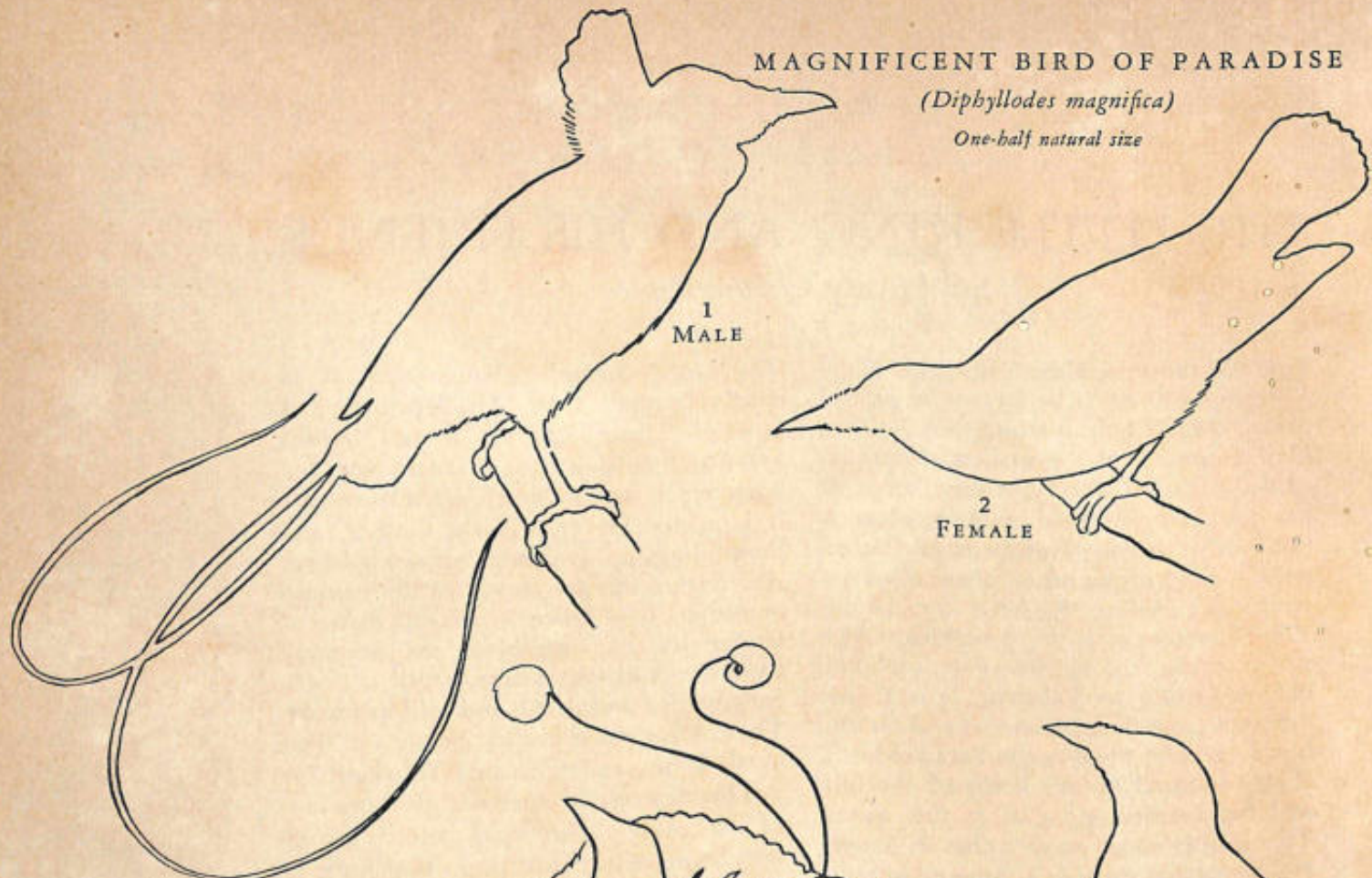
This description does not give any idea of the beauty of this regal gem, its coloration being of brilliant tones that must be seen in the sunlight to reveal their glorious value. The story was that the Birds of Paradise flew from the Aru Islands to New Guinea, returning later, and that on these voyages the little King flew above them directing their flight. As far as is known at present both the King Bird and the Greater Bird of Paradise remain stationary on the Aru Islands, and apparently always have done, the King Bird being of larger size than any of the mainland forms and the Greater Bird restricted to the islands.

Lesson seems to be the first to mention it in life, as he wrote: "The Manucode presented itself twice in our shooting excursions (from Dorey Harbour), and we killed the male and female. This species would seem to be monogamous, or perhaps it is only separated into pairs at the period of laying. In the woods this bird has no brilliancy; its fine-coloured plumage is not discovered, and the tints of

MAGNIFICENT BIRD OF PARADISE

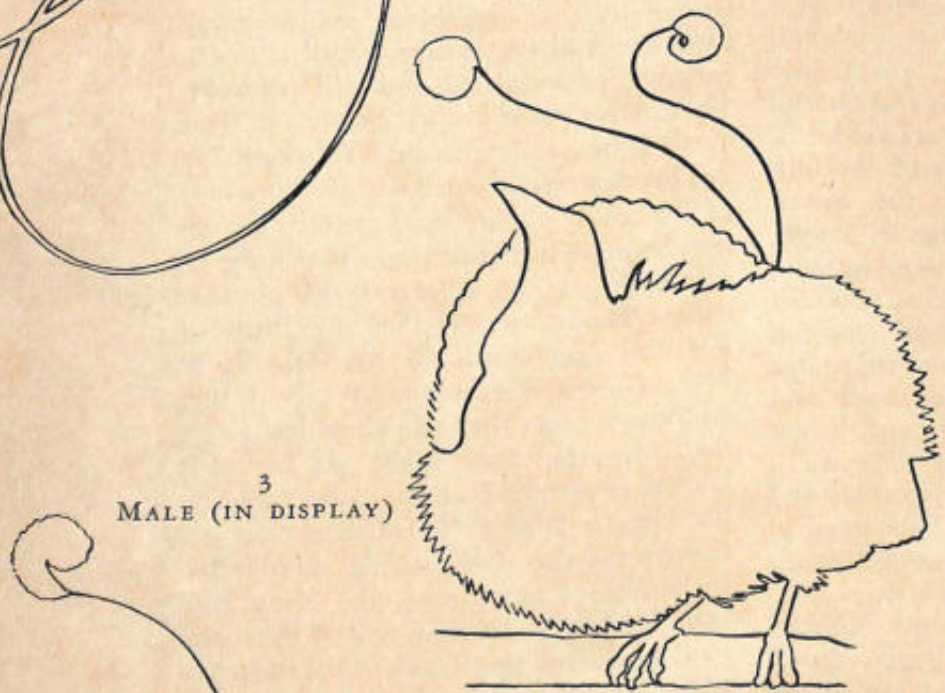
(*Diphyllodes magnifica*)

One-half natural size



1
MALE

2
FEMALE



3
MALE (IN DISPLAY)

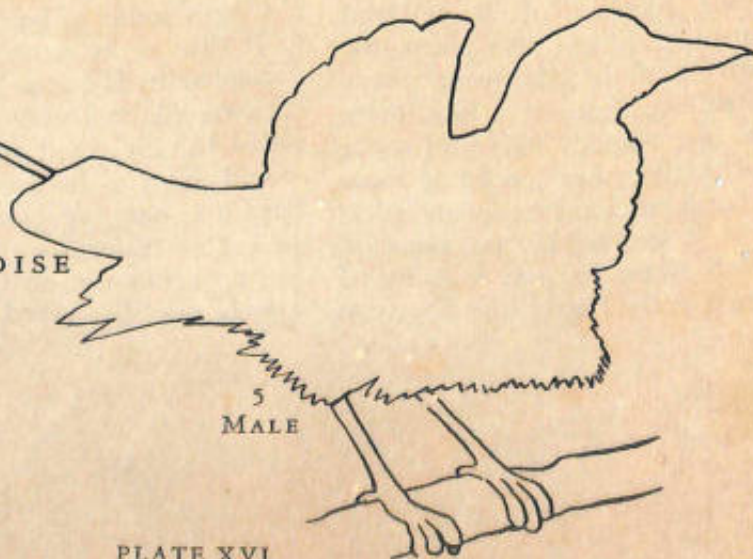


4
FEMALE

KING BIRD OF PARADISE

(*Cicinnurus regius*)

Two-thirds natural size



5
MALE



Lilian Moxley

the female are dull. It loves to take its station on the teak-trees, whose ample foliage shelters it, and whose small fruit forms its nourishment. Its irides are brown and the feet are of a delicate azure. The Papuans call it Saya."

The first account in English was given by Wallace, and though it has been quoted many times it is here reproduced, as it is the best account of a naturalist's feelings upon meeting with such a beautiful bird: "The first two or three days of our stay here were very wet, and I obtained but few insects or birds; but at length, when I was beginning to despair, my boy Baderoon returned one day with a specimen which repaid me for months of delay and expectation. It was a small bird, a little less than the Thrush. Merely in arrangement of colours and texture of plumage, this little bird was a gem of the first water; yet these comprised only half of its strange beauty. Springing from each side of the breast, and ordinarily lying concealed under the wings, were little tufts of greyish feathers about two inches long and each terminated by a broad band of intense emerald-green. These plumes can be raised at the will of the bird, and spread out into a pair of elegant fans when the wings are elevated. But this is not the only ornament. The two middle feathers of the tail are in the form of slender wires about five inches long and which diverge in a beautiful curve. Almost half an inch of the end of this wire is webbed on the outer side only, and coloured of a fine metallic green; and being curved spirally inwards, they form a pair of elegant glittering buttons, hanging five inches below the body, and at the same distance apart. These two ornaments, the breast fans and spiral-tipped tail-wires, are altogether unique, combined with the most exquisite beauty of plumage, render this one of the most perfectly lovely of the many lovely productions of nature. My transports of

admiration and delight quite amused my Aru hosts, who saw nothing more in 'Burong raja' than we do in the Robin or Goldfinch. Thus one of my objects in coming to the far east was accomplished. I had obtained a specimen of the King Bird of Paradise. The emotions excited in the mind of a naturalist who has long desired to see the actual thing which he has hitherto known only by description, require the poetic faculty fully to express them. After the first King-bird was obtained, I went with my men into the forest, and we were not only rewarded with another in equally perfect plumage, but I was enabled to see a little of the habits of both it and the larger species. It frequents the lower trees of the less dense forest, and is very active, flying strongly with a whirring sound, and constantly hopping or flying from branch to branch. It eats hard stone-bearing fruits, as large as a gooseberry, and often flutters its wings after the manner of the South American Manakins, at which times it elevates and expands the beautiful fans with which its breast is adorned. The natives of Aru call it 'Goby-goby.'"

"The cry of this species, which is often uttered, has much similarity to the mewing of a kitten, and sounds like the word 'kau,' which is pronounced in a soft tone like that of a flute," states Rosenberg.

A. Morton noted in connection with birds from the Laloki River near Port Moresby: "frequencing the most dense portions of the scrubs. Like others of its tribe, the Kingbird indulges in showing off something similar to the preceding (*raggiana*), its cry is not so loud, but otherwise resembles that of *P. raggiana*. At intervals, immediately after calling, the green-tipped side-plumes are raised at right angles with the body, or brought forward and vibrated while expanded, the wings slightly raised. The adult males appear to be solitary; on no occasion were

the female are dull. It loves to take its station on the teak-trees, whose ample foliage shelters it, and whose small fruit forms its nourishment. Its irides are brown and the feet are of a delicate azure. The Papuans call it Saya."

The first account in English was given by Wallace, and though it has been quoted many times it is here reproduced, as it is the best account of a naturalist's feelings upon meeting with such a beautiful bird: "The first two or three days of our stay here were very wet, and I obtained but few insects or birds; but at length, when I was beginning to despair, my boy Baderoon returned one day with a specimen which repaid me for months of delay and expectation. It was a small bird, a little less than the Thrush. Merely in arrangement of colours and texture of plumage, this little bird was a gem of the first water; yet these comprised only half of its strange beauty. Springing from each side of the breast, and ordinarily lying concealed under the wings, were little tufts of greyish feathers about two inches long and each terminated by a broad band of intense emerald-green. These plumes can be raised at the will of the bird, and spread out into a pair of elegant fans when the wings are elevated. But this is not the only ornament. The two middle feathers of the tail are in the form of slender wires about five inches long and which diverge in a beautiful curve. Almost half an inch of the end of this wire is webbed on the outer side only, and coloured of a fine metallic green; and being curved spirally inwards, they form a pair of elegant glittering buttons, hanging five inches below the body, and at the same distance apart. These two ornaments, the breast fans and spiral-tipped tail-wires, are altogether unique, combined with the most exquisite beauty of plumage, render this one of the most perfectly lovely of the many lovely productions of nature. My transports of

admiration and delight quite amused my Aru hosts, who saw nothing more in 'Burong raja' than we do in the Robin or Goldfinch. Thus one of my objects in coming to the far east was accomplished. I had obtained a specimen of the King Bird of Paradise. The emotions excited in the mind of a naturalist who has long desired to see the actual thing which he has hitherto known only by description, require the poetic faculty fully to express them. After the first King-bird was obtained, I went with my men into the forest, and we were not only rewarded with another in equally perfect plumage, but I was enabled to see a little of the habits of both it and the larger species. It frequents the lower trees of the less dense forest, and is very active, flying strongly with a whirring sound, and constantly hopping or flying from branch to branch. It eats hard stone-bearing fruits, as large as a gooseberry, and often flutters its wings after the manner of the South American Manakins, at which times it elevates and expands the beautiful fans with which its breast is adorned. The natives of Aru call it 'Goby-goby.'"

"The cry of this species, which is often uttered, has much similarity to the mewing of a kitten, and sounds like the word 'kau,' which is pronounced in a soft tone like that of a flute," states Rosenberg.

A. Morton noted in connection with birds from the Laloki River near Port Moresby: "frequenting the most dense portions of the scrubs. Like others of its tribe, the Kingbird indulges in showing off something similar to the preceding (*raggiana*), its cry is not so loud, but otherwise resembles that of *P. raggiana*. At intervals, immediately after calling, the green-tipped side-plumes are raised at right angles with the body, or brought forward and vibrated while expanded, the wings slightly raised. The adult males appear to be solitary; on no occasion were

two or more found together, like the other species they feed on berries, and seem to be somewhat of a pugnacious disposition. On the whole, they are difficult to obtain until you become acquainted with their note."

Walter Goodfellow noted: "While watching some Pigeons on the opposite bank of the river through his glasses, he saw a small bird rise from the top of a tree and soar into the air like a skylark. After it had risen about 30 feet, it suddenly seemed to collapse and dropped back into the tree as though it had been shot. It proved to be a male King Bird-of-Paradise, and probably this soaring habit is a part of the display not indulged in by captive birds in comparatively small cases."

Claude Grant observed in the South-West that "it is quite the commonest member of the *Paradiseidae* throughout the flats, but does not extend into the mountains. Its clear and distinct call was heard throughout the jungle. It is one of the first of the common birds to be left behind when the mountain ranges are reached."

The display has been well described by Ingram from a bird in captivity: "Always commences his display by giving forth several short separate notes and squeaks, sometimes resembling the call of a Quail, sometimes the whine of a pet dog. Next he spreads out his wings, occasionally quite hiding his head; at times, stretched upright, he flaps them, as if he intended to take flight, and then, with a sudden movement, gives himself a half-turn so that he faces the spectators, puffing out his silky-white lower feathers. Now he bursts out into his beautiful melodious warbling song, so enchanting to hear but so difficult to describe. Some weeks ago I was crossing a meadow and heard the song of a Skylark high up in the heavens and I exclaimed at once, 'That is the love-chant of

my King-Bird.' He sings with a low bubbling note, displaying all the while his beautiful fan-like side-plumes, which he opens and closes, in time with the variations of his song. These fan-plumes can only be expanded when his wings are closed, and during this part of the display he closes his wings and spreads out his short tail, pressing it close over his back so as to throw the long tail-wires over his head, while he gently swings his body from side to side. The spiral-tips of the wires look like small balls of burnished green metal, and the swaying movement gives them the effect of being slowly tossed from one side to the other, so that I have named this part of the display the 'Juggling.' The swaying of the body seems to keep time with the song, and at intervals, with a swallowing movement of his throat, the bird raises and lowers his head. Then comes the finale, which lasts only for a few seconds. He suddenly turns right round and shows his back, the white fluffy feathers under the tail bristling in his excitement; he bends down on the perch in the attitude of a fighting cock, his widely opened bill showing distinctly the extraordinary light apple-green colour of the gullet, and sings the same gurgling notes without once closing his bill, and with a slow dying away movement of his tail and body. A single drawn-out note is then uttered, the tail and wires are lowered, and the dance and song are over. The King-Bird has another form of display which he very rarely exhibits, and only on three or four occasions have I seen him go through this performance. Dropping under the perch the bird walks backwards and forwards in an inverted position with his wings expanded. Suddenly he closes his wings and lets his body fall straight downwards, looking exactly like a crimson pear, his blue legs being stretched out to their full length and his feet clinging to the perch. The effect is

very curious and weird, and the performance is so like that of an acrobat suddenly dropping on to his toes on the cross-bar of a trapeze that I have named this the 'Acrobatic' display. It has been witnessed on different days to his 'Juggling' display. While giving his acrobatic performance he sings the whole time, but never shows his side-plumes; and when he is in the pendulous position his body sways gently as if it were influenced by a fitful breeze. The whole of the performance takes but a very few seconds."

Another writer has observed: "Even the little King, the gem of all I know (in captivity), is not above stealing eggs and young out of the nests of smaller birds. This King Bird of Paradise is a great mimic. He often delights to give the note of the Butcher Birds, followed by a warning call which sends quite a repertoire of calls, some not unpleasant, and his voice, like that of the Red Bird (*raggiana*) is heard often and far off. My King Bird is very anxious for a mate, to judge by certain calls and his behaviour. I have seen him raise his two tail plumes Lyre Bird fashion, puffing out and dropping the wings like a clucky hen, giving a peculiar call at the same time, which leads me to believe that this display is a love dance for the edification of the hen."

The little King was separated as a genus *Cicinnurus* very early in the history of these birds, and nearly every student has remarked upon his small size and anomalous position in the group. Smallest of all, it has been compared in size with a sparrow, but without its glorious colouring it would attract by its form and especially by its ornamentation. The head appears very flattened through the frontal feathering approaching on the bill and being stiff and erectile on a level with the more flattened feathers of the crown. The bill is not very short, but the exposed portion is, laterally compressed, culmen

keeled, tip a little decurved, sharp, posteriorly notched, rather deep, nasal groove, hidden by feathering, half the length of the under mandible, nasal apertures long linear slits barely visible, interramal space long nearly half length, gonys keeled, a little ascending. The wing with the first primary narrow and pointed, about half the length of the second, which is also pointed but broader, the third a little longer than the seventh; fourth, fifth and sixth subequal and longest, the innermost longer than the second and equalling the secondaries, which are broad and rounded at their ends and the inner ones (tertiaries) disintegrated. The tail short and square, feathers medium, the central pair elongated as wires ending in a curled disc-like terminal, the wire webbed on the outside, but appearing on the inside through the wires crossing at base, the upper tail coverts as long as the tail disintegrated. The legs are rather long and thin, the outer surface smooth, back bilaminar, the toes long and thin, claws long, outer a little longer than inner, hind toe longer and stout, the hind claw stout, hind toe and claw longer than middle toe and claw. The coloration of *Cicinnurus regius* is bright shining crimson above, the forehead sometimes paler, more orange; a round spot of dark green, almost black, feathers above the eye; wing feathers brown with red edges, tail feathers brown with red edges, central pair with bright shining metallic terminal disc, brown below, throat crimson, lower margin yellow, separating it from narrow green band, rest of under-surface white, flanks brownish; pectoral fan broad, round tipped, iridescent bar of metallic green separated by a narrow whitish line from the grey bases, broad feather ends fan-like; a lower flank fan is also erectile but lacks the iridescent margin tipping.

The little female of the King is quite unmajestic, having the head dull greyish

olive concolour with the back rump and upper tail coverts, the tail feathers brown with pale rufous edging, and also longer than in the male, with the two middle feathers a little longer than the others and the tail is square otherwise, the feathers of medium width. The wing feathers are brown with faint reddish edging, but the broad long secondaries are broadly margined with rufous, the inner lining of the primaries and secondaries pale rufous. Round the eyes and cheeks the feathers have buff tips producing a streaked appearance which is intensified on the chin and throat, these parts being streaked buff and brown; the rest of the under-surface is pale fawn with narrow bars of brown, not very closely packed on the breast, but more distinct on the sides and flanks. The young male is similar, but the barring seems closer and the throat patch of the adult indicated. The change by means of moult is somewhat curious, as the pen-feathers of the adult throat appear simultaneously so that the throat patch looks like a scaly patch; then the feathers burst through from the breast upwards to the throat; sometimes the flank feathers and fan will be produced before the breast and abdomen feathers in the middle are lost, and the back feathers seem to come out in patches without design; and even the tail feathers of the adult may be seen before the body feathers have moulted. Study of the immature and female plumage and moults might assist in the discrimination and understanding of the species and subspecies. It might also be of value as it is quite unlike the moult stages of northern birds, and has no exact time limits, taking place according to wet and dry seasons, altitudes and temperature. This is a lowland bird (as a rule), but still there is variation seen in these immature specimens according to locality even in the apparent same geographical area.

Critical examination of large series of the little King will uncover many principalities each with its own population. For a century and a half of systematic work no distinction was made from the extreme west to the extreme east. The first breaking up was due to the obsession of Rothschild and Hartert that all island forms should be distinctively named, however slight the difference and however small the island, while birds of the mainland could be disregarded as individual variants. Thus it came about that birds from Jobi were critically examined, and it was noted that the forehead was all crimson, while mainland birds showed a vermilion forehead. Then it was named *C. r. coccineifrons*, Rothschild gravely asserting that it also showed the dark spot above the eye as a vertical streak, but that meant nothing as it was also seen in mainland birds. This remark was due to the fact that the meticulous Meyer, in recording birds for Constantine Harbour, had mentioned "the black marking over the eye appears to be very long and pointed." Another quarter of a century almost passed when Ogilvie-Grant, dealing with the birds from south-west New Guinea collected by the British Ornithologists' Union Expedition, emphasised the linear eye streak, giving cuts of *coccineifrons*, *regius* and his new *C. r. claudii* differing from the first named in having the black supraocular spot rounded as in the second, not linear, the feathers on the forehead are shorter and not so dense and do not approach so near the end of the bill as in *C. r. coccineifrons*. The scarlet colour of the forehead separates it at a glance from the orange red fronted *C. regius*. Wing 100 mm. The true *C. regius* is confined to the Aru Islands. It is rather larger than *C. r. claudii*, with a wing measurement of 103.5 mm. Seven years later Stresemann reviewed the species, using mainly north-

ern series, and added three more subspecies, using the linear streak as a separative feature, especially as it was more or less allied with the forehead coloration and the feathering on the base of the bill. The first, *gymnorhynchus*, was from the Huon Peninsula and was a smallish form with orange yellow forehead and longish exposed bill; the second, *similis*, from a little further west only with same size, similarly coloured forehead but short exposed bill and narrow vertical black streak above eye; the third, *cryptorhynchus*, still same size, redder forehead, small exposed bill, still further westwards to the Mamberano district. The last named was later recorded from the Weyland Mountains, where it was reported living alongside *claudii*, this having the round spot above the eye, while *cryptorhynchus* has a streak.

Following up this separation we find that two series can be distinguished, the *regius* series with the round eye spot and longer exposed bill, and *coccineifrons* group with the vertical streak above eye and shorter exposed bill. Then it will be seen that these have distinct distributional areas, the latter ranging along the north coast from Jobi Is. towards the Huon

Peninsula, the typical *regius* from the Aru Islands and apparently the Arfak Peninsula, and all southern New Guinea, and along the north coast of south-eastern New Guinea to the Huon Peninsula. Except the attack by Stresemann on the north coast specimens, no one has worried much about subspeciation, and it is possible that the females will assist, as somewhat different females have been seen. It will be noted that *claudii* is the only name available for all the southern birds, but there is little doubt that many subspecies of the same grade as the northern ones will later be separated.

Stresemann used *similis* for birds from the Sepik district lowlands, and the description generally agrees with specimens from the Mt. Hagen district where some were collected at 6,500 feet, an altitudinal limit not previously reached. These show some differences from Port Moresby specimens in coloration as well as in the bill and eye streak features, being brighter on the back and secondaries, paler upper tail coverts, darker throat, bronze tipping of fan larger and deeper, and central tail feathers "coins" appear to be smaller and more tightly curled.

THE LONELY LITTLE KING

Plate xiv, Fig. 3

Nearly fifty years ago a somewhat different little King was recorded, but whence he came was at the time unknown. The most notable distinction was the difference in the terminals of the wiry central tail feathers, which were less webbed and did not form complete discs. In addition the tail itself was said to be emarginate, not rounded, and the green breast band was much deeper. Little attention was paid to it for a quarter of a century, when a similar bird was collected by Walter Goodfellow in the Cyclops Mts. 3,000 ft., Humboldt Bay, N. Dutch New

Guinea. Another specimen has been reported from the same locality. The original *Cicinnurus lyogyrus* was apparently badly described, as Rothschild printed: "Differs from *C. regius* (Linn.) in having the pectoral shield nearly four times as long as in the latter, it being almost as long as broad; frontal plumes shorter, not projecting forward beyond middle of bill and not obscuring the contour of the skull; tail emarginate instead of rounded; outer web at end of central tail shafts only two thirds as wide near base, the width uniform for the greater part of its length,

instead of narrowing rapidly to the tip, much more loosely coiled; the apical portion of the naked crossed tail-shafts divergent instead of convergent. The crimson of the back is darker; crown and forehead orange-vermilion, not orange-chrome; pectoral tufts smaller, darker and subterminal buff-line on each plume much narrower, darker, and less conspicuous; pectoral shield, except a narrow edging on lower border and tips of central tail-feathers, grass-green, not emerald-green, and the tips of the pectoral plumes are narrowly tipped with yellowish emerald-green, not broadly tipped with golden green primaries of a duller orange-rufous. Measurements given by the author: Wing 200 mm. (evident misprint for 100 mm.), tail without central tail-feathers 48 mm., tail with central feathers unrolled 330 mm., culmen 42 mm., metatarsus 50 mm., middle toe 37 mm. Through the kindness of the authorities of the U.S. National Museum, I have been able to examine the type of this species. The width of the green pectoral shield, the shape of the tail and middle rectrices, and the dark colour of the forehead (which is as dark as in *C. regius coccineifrons*) are very striking characters, and it is a great pity that the locality whence this bird came is unknown. By some curious mistake most of the measurements in the description are wrong. The wing measures 102 mm., and not 200 mm., the tail with the central feathers unrolled 167 mm. and not 300 mm., the culmen 22 mm., and the metatarsus 30 mm. Habitat unknown."

Ogilvie-Grant described *Cicinnurus goodfellowi* from the Cyclops Mountains 3,000 feet as: "Adult male. Most nearly allied to *C. lyogyrus*, having a similar wide green pectoral shield. It differs, however, in having the general colour of the upper parts of a bright orange crimson, lighter than in *C. regius*; the chin and the upper part of the throat orange-red, shading into

dull crimson with purple reflections on the lower throat and foreneck; in lacking all trace of the buff tips to the feathers of the foreneck, which in *C. lyogyrus* and the other species of the genus form a marked convex line dividing the dull crimson of the foreneck from the green of the upper breast; and in having the flank-feathers dark sooty-brown glossed with coppery-purple. Iris dark brown, bill yellow, feet dark cobalt blue. Total length, without the middle tail feathers, ca. 6.0 in., culmen from the base of the forehead 1.1 in., exposed portion .6 in., wing 4.1 in., tail 1.55 in., middle tail-feathers 7.6 in., tarsus 1.3 in."

Rothschild later commented: "In my opinion this bird is nothing more than a hybrid between *Cicinnurus regius* and *Diphyllodes gulielmi-tertii*. It is exactly intermediate as regards tail, breast shield and flanks." It may be recalled that just previously he had enthused about *C. lyogyrus*. Then a third specimen from the same locality was recorded by Stresemann as *C. goodfellowi*, apparently as a good species, and he also pointed out that perhaps the *gulielmi-tertii* was itself a hybrid.

Through the kind assistance of my friend, Mr. N. B. Kinnear, now Director of the British Museum (Natural History) a painting has been made of Goodfellow's specimen by Miss R. G. Talbot-Kelly, and this is here reproduced. From the painting it seems to be an unmixed *Cicinnurus*, as the green breast band varies a little according to locality, and the uncurling of the wire tail feathers is seen in the immature of *Cicinnurus*.

The exact synonymy of *lyogyrus* and *goodfellowi* is not absolutely certain, as in addition to the colour differences noted a rough line sketch of the head of *lyogyrus* shows a linear mark above the eye, while the painting of *goodfellowi* shows a rounded spot.

THE EXQUISITE LITTLE KING

Plate XXI, Fig. 5

This exquisite little regal gem was christened after the King of Holland, but it is too beautiful to be handicapped by such a name in these enlightened times. Seventy years ago it first saw the light, and since then more than a dozen specimens have turned up without showing much variation, but its rarity has caused doubt as to its parentage. Apparently it lives in some restricted spot or mayhap altitude so that it may still be a long time before the truth can be ascertained.

The genus *Rhipidornis* was introduced for the species named after the King of Holland when it was reported from Wai-giou, a locality now doubted but still a possibility. Apparently it was introduced in the "Zoological Garten" on 1st January, 1815, twice on succeeding pages, but although this is not available it is not very important as it was mentioned in "Nature" within a week or two, then recorded in the London Zoological Society's Proceedings the same year, and also figured in the Mus. Dresden. So that there is no worry about its determination. It was classed as one of the Magnificent series of the King group, but it seems more like a King, so that as it is not a true King it was generically separated as above. Nothing is known of its habits nor even its exact home, so all that can be offered here is a detailed description from a specimen in the Australian Museum, probably one not included in the numbers recorded by European and American writers. As will be also seen by the illustration herewith it agrees well with the specimens already figured.

The bird is of small size, more that of a King than of a Magnificent, the bill, small, nostrils concealed by feathers, a thick apparently erectile mantle, but feathers not clipped at edges, back feathers

full, breast shield and fans from sides of breast, wings short, tail square with two central wiry feathers with incurved half webbed tips. The wing has the primaries narrow, a little pointed, the secondaries long and broad, the first primary short, about half the length of the third, the fourth and fifth a little longer and sub-equal, the secondaries longer than the second primary. The legs long, thin, toes slender, legs smooth back and front, inner toe less than outer, middle toe longest, hind toe long and stouter.

The feathers of the head are short and stiff, recalling those of the King, pale reddish brown in colour, the nuchal feathers brightened, the bases pale yellow; the back feathers (probably erectile) deep crimson with yellowish bases, lower back and upper tail coverts brownish red; the tail feathers brown with paler edges, the two centre feathers elongate wire-like bright shining metallic oil green. The wing feathers brown with dull reddish edges, secondaries crimson, the outer ones a little disintegrated, the inner with brown inner webs, inner lining of primaries pale yellowish. Sides of face brownish red, throat small cut feathers of velvety dark brown with a crimson sheen, succeeded by a row of metallic blue feathers, then followed by a breast shield of bright green margined with a blue border, with a green sheen in certain lights, lower breast and abdomen maroon with purple tinge, medially white, which continues on to the under tail coverts. A fan is produced similar to that of the King, of dark brown feathers with a metallic band at the tips, 4 mm. wide. Wing 108 mm., tail 39 mm., middle feathers about 200 mm., bill 20 mm., tarsus 30 mm.

The female was described by Meyer, and a figure was placed in the background

in Sharpe's Monograph of a bird which could be the female, but Beccari had written: "It seems most improbable to me that this bird was found in Waigiou, because the type specimen (which I have seen) was, if I do not mistake, prepared in the manner of the 'alfieros' of New Guinea, and was acquired at Salawatti from a 'Bugis Nakoda' (captain of a Celebes boat) to whom it had most likely come from Has. It seems to me hardly probable that the female is the bird that has been described as such. I have had information of this bird at Wa-Samson; and it is not improbable that it may also be found at Salawatti."

This beautiful bird has been recently relegated to the hybrid-concoction, its suggested illicit parentage being due to the mistake of a Magnificent co-operating with a King. Aviculturists would like to see such a glorious bird result from a mating of these two if they could be persuaded to breed, but have no hope of such a consequence. It seems that the suggestion is valueless at the present to account for our lack of knowledge, and there is so much undisturbed territory in New Guinea and the Islands that hope may not yet be abandoned of finding the home of this "exquisite little regal gem."

THE MAGNIFICENT

Plate XVI, Figs. 1 and 2

To some eyes this bird may not deserve this epithet, which was early granted it on account of the number and variety of its colours rather than on the splendour of its physique. Thus his flattened head of speckled brown velvet is succeeded by a small brown (iridescent) nape band which is followed by a pale yellow collar ruff, the feathers with curious edges as if they had been trimmed into a curve by a pair of scissors. Immediately the back swells into a puff of deep crimson, the lower back being only a dirty brownish yellow with the tail brown. But there is still more, as the short wing feathers are merely brown, but these are half concealed by the very long broad secondary feathers which vary from bright golden to pale yellow, forming a bright patch. The under-surface is as remarkable, as under the bill is a large full tuft of blackish velvet, almost all the rest of the under-surface being occupied by an immense breast plate of brilliant (again not iridescent) green, but adorned medially by a narrow strip of iridescent blue green metallic feathers. The breast-plate is edged with a row of

shining blue feathers separating it from the abdomen and under tail, whose feathers are merely deep velvety maroon, almost black. Under the wing is yellow, as is the inner wing lining, while from the short square tail the two central tail feathers seem to spring out like uncoiled springs, wire-like but with an inner web of very short webbing, of a brilliant shining blue above, greyish below.

D'Albertis' notes read: "This bird is very rare in the Arfak mountains, but more numerous on the plains and near the coast; still I could not obtain any adult males, and could only procure a few skins prepared by the natives. The skins sent will probably be interesting."

Beccari added: "is also pretty common, and easy to kill when one has learnt to know its song, which resembles a kind of 'teia-teia-teia' repeated several times with diminishing force. The sound produced by kissing the palm of the hand is a very good imitation. When once you have heard the song, if you approach carefully, especially early in the morning, you will find some small spaces about a yard

and a half in diameter and cleared of sticks and leaves, where one or two males are paying court to a female. The males then erect all their feathers; the skin of the neck swells up like a bladder; the head seems like the centre of an aureola, which is formed beneath by the expanded feathers of the breast, and above by those of the yellow mantle, which are carried in a perfectly vertical position and spread like a fan. I kept a bird of this species alive for some days. It is found sometimes at a little distance from the sea, on the plains, but perhaps more often on the hills at 1,000 to 2,000 feet of elevation, preferring open places and the vicinity of streams."

Rand has recently given a very full account of the display at the playing grounds of this species, which unfortunately he sometimes calls bowers, as that word has hitherto been restricted to the structures built on the playgrounds, and this bird does not appear to make any buildings. The display area in each case consisted of a more or less circular area on the ground about 15 to 20 feet across from which all leaves, twigs and small plants had been removed. Numbers of saplings, mostly dead, stood in the display ground. Above, the leaves had been plucked from the saplings and lower trees, and in places the bark plucked from stems so they were frayed. Probably the dead saplings had been killed in this way by the bird. The result was a clear cone through which light from the sky reached the ground unimpeded. This would be an advantage to the displaying bird in increasing the brilliancy of its colours. The "bowers" did not all face the same direction, one was on a slope facing the east, one the north, and two the west. He never saw more than one adult male at the playground at one time, and the female plumaged bird which visited it never worked at clearing the display ground. At the ground the

male spent much time clearing, picking up leaves and twigs that had fallen and throwing them to the outside of the cleared area. In the mornings the bird was always present when he arrived. It was apparently away during the forenoon, now and then merely visiting it. In the afternoon it was usually present all the time. When the male was alone it usually spent most of its time sitting on one or another perch, near the edge of the "bower" and from two to fifteen feet above the ground. It often sat thus for long periods, sometimes up to thirty to forty minutes at a time. Much of this time was spent preening its feathers. The body plumage and wing feathers were carefully gone over and the bird frequently stretched, when the wings were carried over the back and the cape shot forward over the head. The male frequently called from its perch near the edge of the display ground. These loud, far-carrying calls are apparently for the purpose of advertising the bird's presence. They were rarely given while the bird was actually in the display ground. The calls given by the adult males varied considerably. Most of them were loud harsh calls recalling those of related genera. Those used at the bower to "advertise" its presence he recorded as a violent or strident "ca cru cru cru", a loud clear "car" or "cre" repeated a number of times, a hoarse or squalling "caaar ca ca ca". In one display the body was held in the normal perching position, the breast shield was more or less expanded and the outer upper corners of the shield were more or less raised so that in extreme cases they stood up on each side of the head. Undulations in the breast shield sent shimmers of iridescence across it. The iridescent spots in front of the eyes sometimes became conspicuous. This was the most commonly seen type of display. It was seen only when the bird was on a perch in the display ground, within a foot

or so of the ground. It was sometimes apparently given when the bird was alone. When displayed toward another bird the breast was usually turned toward it. In a second form of display the bird was always clinging to the side of a sapling a foot or so from the ground, when it very suddenly extended its body horizontally with breast turned upward, the breast shield elongated and flattened, the yellow cape shot forward under the head in line with the body. When sunshine reached the floor of the bower", it appeared to make no difference to the bird, but even light showers of rain at once sent the bird to a sheltered place. For twenty minutes during a shower one afternoon the male left the playground and stayed almost motionless under the shelter of a clump of moss on a tree trunk near the ground on the edge of the playground. Not more than one adult male was seen at the ground at one time, but when he introduced a mounted adult male it was recognised as a male at once, the attendant male flew to attack it and erected his cape as an intimidation device.

It has been suggested that the male attracts females to this playground for mating and that otherwise the male is not concerned in the nest building, incubation duties or young feeding, but this appears to be supposition without any factual basis.

It is necessary to define the genus *Diphyllodes* before discussing the species and its variations. The bird is small but a little larger than the King and has a longer wing and larger bill, but the ornamentation is diverse and different, as already noted. The bill is long and thin, the nostrils hidden by the frontal feathers advancing on the nasal groove, but not proceeded forwards, straight, the culmen arched tip small, posterior notch slight, culmen keeled, interramal space small feathered, gonys long, not keeled, a little

ascending. There is a small naked strip behind the eye. The wing has the first primary short, about half the length of the third, the fourth to sixth a little longer and subequal, feathers narrow, pointed, the secondaries long, broad, round tipped, not reaching the end of the primaries but longer than the second, and decreasing inwards. The tail is short and square, feathers broad, two central feathers alternate into long wires curved outward at tip and with very small external webs. The legs are medium, slender, the front showing scutes obscurely, back bilaminate, toes long and slender, mid toe longest, outer longer than inner, claws small, hind toe stouter, claw longer. There are two erectile ornaments, a nape fan and a breast shield.

In coloration the male has the flattened head covered with short stiff feathers of brown coloration, a nuchal edging of longer feathers of golden brown, then a nape frill of pale yellowish flat feathers with curiously clipped edges, with a following reddish black triangular patch, the lower back and upper tail coverts reddish brown with paler tips, the tail feathers brown, the central pair shining green. Underneath the chin feathers almost form a tuft, the throat blackish brown, then a line of metallic blue, succeeded by an immense breast shield almost covering the under parts; this is composed of soft bright green feathers, the marginal edge all round with glittering tips, and down the centre is a series of blue tipped feathers about three or four feathers across. This almost reaches the lower margin of the shield. Below the abdomen is sooty brown. The primaries are brown with the basal edges golden, the secondaries broader edged until they are almost all orange brown save the tips, and sometimes the bases are scarlet tinged. These colours have been generally named, as in each locality the shades vary, and this has

caused much confusion in naming the subspecies suggested by the differences.

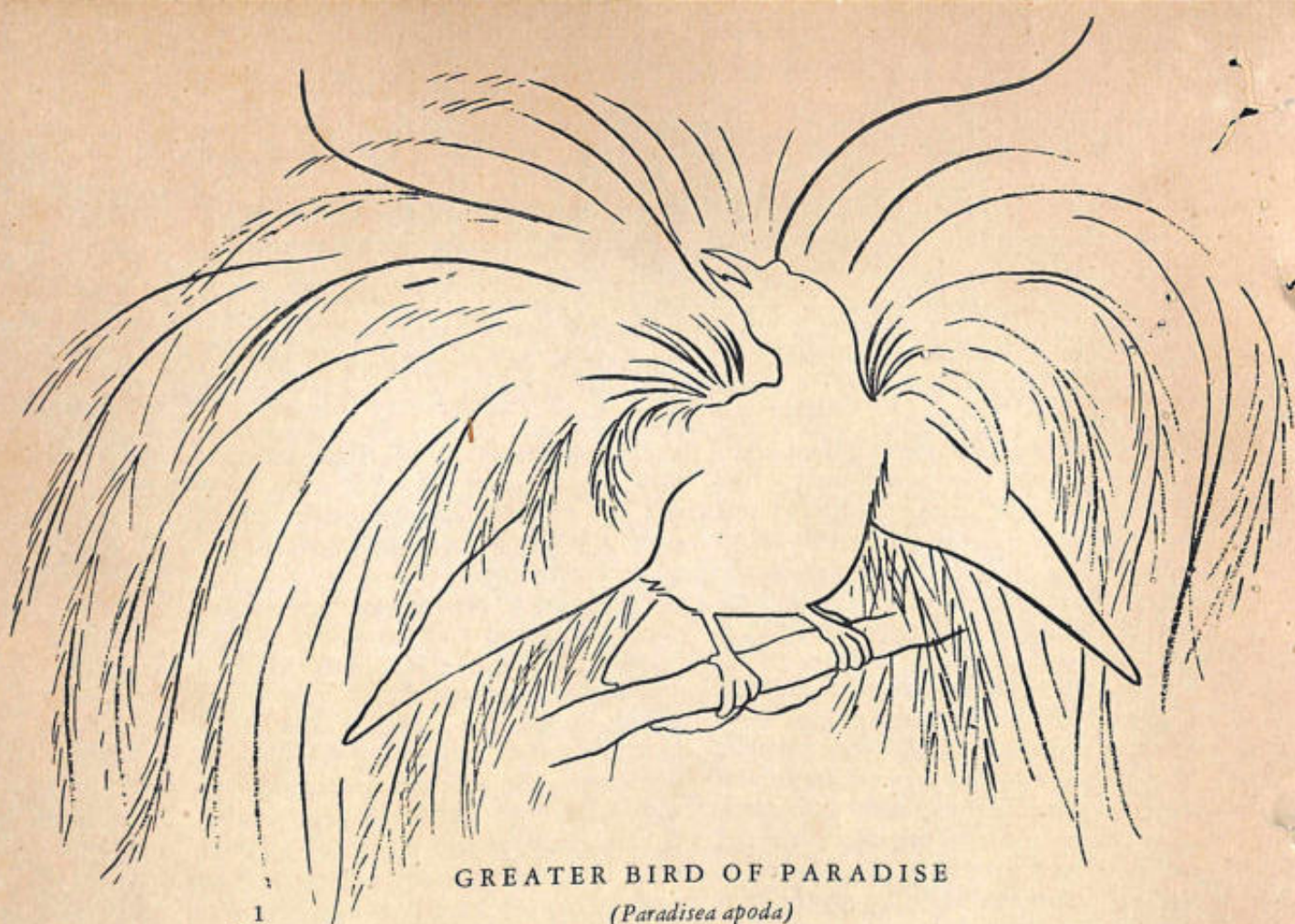
Until the time of Elliot's *Monograph* workers, probably from lack of material, had not noted any differences, but Elliot figured a bird which had been separated by Gould as the golden-winged, the original having dull coloration, but it was not the wings proper that showed the colour, it was the secondaries. Unfortunately the bird figured by Elliot was from unknown locality, and it was assigned to the island of Jobi. But the exploration of south-eastern New Guinea opened up a question, as Hunstein's collection showed similar "golden wings" and Goldie, Broadbent and others had also found such birds. It was resolved at first to use Elliot's name for this south-eastern bird, a very mistaken idea, as no birds had been received from this locality when Gould named his specimen. However, Finsch and Meyer seemed to find another race in the Horseshoe Range specimens, which they named after the collector Hunstein, and in order to settle the matter also named the Jobi Island form. This led to re-investigation and it was decided that the Golden-winged must have come from Jobi, and that all the south-eastern birds were referable to the same race and that could bear Hunstein's name. This seemed a simple solution and was used by Sharpe in his *Monograph* with the addition of another species. He restricted the original form to the island of Salawatti and named the mainland western form as different, using an old name given by Lesson which was certainly not available. Meyer then separated the bird living in the Huon Gulf area, but a little later Rothschild and Hartert reviewed the species and allowed three forms only! A notable feature available was the crown covering, which was brown with a greyish tinge in all the western birds, whatever their "wing" coloration was, whereas all the eastern birds

showed a brown head very definitely of a reddish shade. This provisional settlement lasted until Ogilvie-Grant made another grouping based on poor data, and named the Salawatti bird after Rothschild, the western New Guinea bird *magnifica* (he used *speciosa*) and the eastern one *hunsteini*.

There seems to be such slight variation that only the "clay-coloured" wing form and the golden wing seem separable at sight, and that all the others have a technical interest only.

The forms at present may be arranged thus: the typical form may include the Salawatti and Arfak Mt. birds with the dull brown head and dull orange brown (clay) secondaries. This may be called *D. m. magnifica*, and *rothschildi* would be a synonym: *D. m. chrysoptera=jobiensis* with same head and orange secondaries; *D. m. hunsteini* for the reddish brown head and orange coloured secondaries; perhaps *septentrionalis* is distinct from this subspecies; Hartert separated another form from the foothills of the Snow Mountains as *D. m. intermedius* with the secondaries brighter than in *magnificus* and much less bright than in *chrysopterus*. On this separative value the subspecies from the Mt. Hagen district may be named *D. m. extra* as the head is dark brown with little golden tinge, the nape frill greenish yellow, the upper back dark crimson red, the lower back yellowish brown, the breast shield bright shining green with the medial blue strip very narrow, not more than two feathers broad, the marginal feathers greenish blue and the abdomen blackish brown.

As regards moult this species moults all the head feathers, the large nape frill and the huge breast shield feathers simultaneously, so that the whole of these parts may be seen in pensheaths, giving a curious plucked appearance; then the feathers burst rapidly from the lower margin of



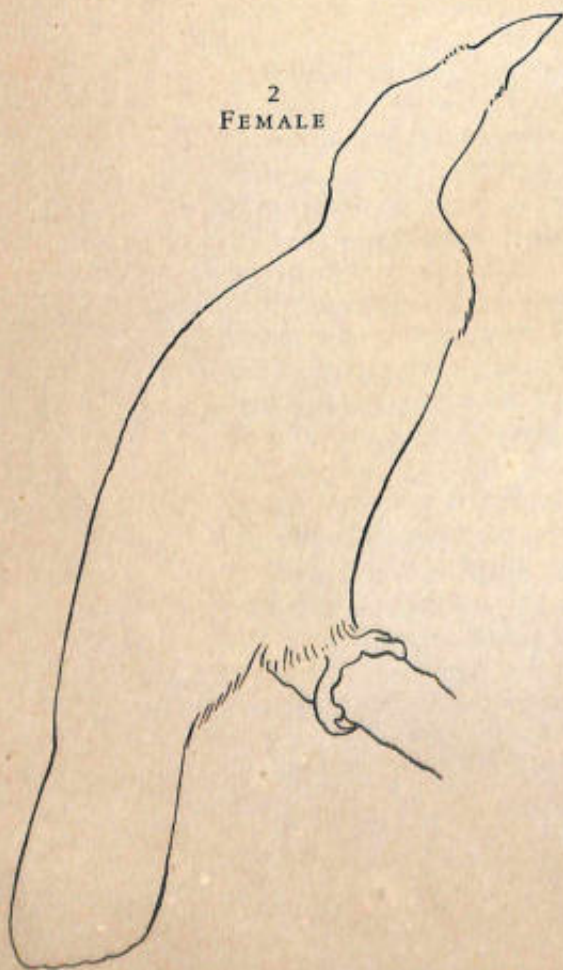
1
MALE

GREATER BIRD OF PARADISE

(*Paradisea apoda*)

One-fourth natural size

2
FEMALE



3
FEMALE



BARE-HEADED
LITTLE KING

(*Schlegelia wilsonii*)

Two-thirds natural size

4
MALE





Lilian Mearns

the breast shield first. The moulting of the other parts of the body seems irregular, as patches of feathers may be seen here and there, with odd wing and tail

feathers in the new stage present. Sometimes the secondaries appear early, giving a bright colour patch on the otherwise semi-naked bird.

THE BARE-HEADED LITTLE KING

Plate xvii, Figs. 3 and 4

It is unfair to call this quaint little bird a King, as it was named the Republican by a Prince. But, ignoring politics for a few moments, the species belongs to the Magnificent series of the King group, easily separated by its curious bare head marked by a cross, so it might as well have been called a Crusader.

It is one of the smallest, about equal to the little King, and has the forehead feathered, the crown and back of the head bare save for a strip of feathers down the centre crossed by another strip from side to side, and with a second band across the nape; the naked skin is bright blue; this is succeeded by a small yellow nuchal tippet, the back being crimson with a black margin, the rump and tail brown, the two middle tail feathers very narrow, elongated and crossed, then curving inwardly, the same length to the tips; wings and wing coverts brown, inner feathers edged with scarlet; a bright green breast shield covering nearly the whole under-surface, edged with blue. Such is a crude description of this beautiful little gem, whose tangled history is a comedy of errors beyond anticipation. It is restricted, as far as is yet known, to the islands of Waigiou and Batanta, where its habits are said to be similar to those of the Magnificent, apparently also living on the lowlands near the sea. Little else has been reported about it.

Its history begins when a specimen, en route in a collection to America, was seen by Prince Bonaparte, a nephew of the famous Napoleon; the Prince was the most enthusiastic ornithologist of his time,

and was so charmed by this little beauty that, at probably the first chance, he interposed a note regarding it while discussing the classification of Parrots before the Academy of Sciences in Paris. He apologised for introducing one of the most magnificent species which had been discovered for a long time. It was near to the Superb Paradise-bird of authors, *Lophorina superba Vieillot*. "The new species, *Lophorina respublica*, is characterised so: mantle with the long plumes of the nape, red. Here in contrast is the diagnostic phrase of *Lophorina superba*; mantle with the long plumes of the nape yellow."

This was absurd, as the Superb is all black, so that a month later Bonaparte corrected this egregious error by stating that through a pen slip it was not with the Superb but with the Magnificent that this remarkable Paradise-bird should be compared, and that it should be called *Diphyllodes respublica*. He did not correct the diagnosis and in his great work "The Conspectus", published a little later, he used *Diphyllodes*, but continued the erroneous diagnoses giving his explanation of his specific name. Up to this time it had been the custom to give to the most beautiful birds the names of Princes, but as far as he was concerned he had not the slightest regard for all the rulers in the world. Therefore he had named this most handsome Bird of Paradise after the Republic: that Republic which might have been a Paradise had not the ambition of Republicans, unworthy of the name they were using, made it by their evil actions

more like a Hell. But if it be not possible for a Republican Paradise to exist, let us make a *Paradisea respublica*, a Republican Bird of Paradise. It will be seen that this Republican Bird made a very sorry beginning in error and mistake after mistake.

When the bird arrived in America it entered the collection of the Academy of Sciences at Philadelphia, and ignorant of the action of Bonaparte, as there was little rapid transit in those days, Cassin fully described the bird as a new species, in the following accurate description: "*Paradisea wilsonii nobis*. Form: Specimen about to be described, probably not fully adult, somewhat mutilated, skin of the hinder part of the head wanting. Plumage compact, with elongated feathers from sides of the neck, and two plumes having their origin at the base of the tail, which latter are curved into circles, of about one inch in diameter. First primary spurious, third and fourth longest and nearly equal. Exposed portion of the plumage of the back thread-like; feathers of the belly broad and truncate. Sub-generically related to *Paradisea magnifica*. Dimensions: Total length of skin from tip of bill to end of tail about $7\frac{1}{4}$ in., wing $3\frac{3}{4}$ in., tail $1\frac{1}{2}$ in. Colours. Back crimson, which colour is completely enclosed by an edging of black, and forms a somewhat cordate mantle. Large nuchal spot pale yellow. Front and chin black. Wing coverts and quills hair-brown, greater coverts and primaries narrowly edged, secondaries and tertiaries broadly edged with crimson, some of the more exposed tertiaries almost entirely of this colour, and tipped with black. Tail and coverts above and below hair-brown. Ornamental plumes of the tail steel blue. Elongated feathers on the side of the neck black, with a beautiful coppery lustre, and tipped with bright green. Under parts from the neck to the abdomen silky green, the feathers brown at their bases, and

having intermedial (between the brown and the green colours) triangular spots of a deeper glossy green, inclining to blue upon the neck and breast; truncate feathers of the sides and belly tipped with deep shining green, posterior part of abdomen dull brownish black. Hab. New Guinea? Obs. This very handsome Paradise-bird is one of the most valuable and interesting of the many contributions to the collection of this Academy, made by Mr. Edward Wilson, of Lydstip House, Pembrokeshire, to whom I have taken the liberty of dedicating it, as a slight acknowledgment of his valuable services to the cause of zoological sciences in this country. This species is a congener of *Paradisea magnifica* Lath, but does not resemble that, or any other known species to an extent sufficient to render special designation necessary. All the species are in the collection of the Academy. The specimen now described was obtained by Mr. Wilson in England, but bears no label indicating locality. It is probably not fully adult."

A few lines later Cassin refers to "another of the valuable acquisitions made in Paris by Mr. Edward Wilson," so probably England above is a pen slip. In the German Zoological Record for 1850 Hartlaub noted that Cassin's and Bonaparte's species were the same, but repeated Bonaparte's false diagnosis.

Apparently someone disputed this, as Bonaparte a few years later explained: "My *Diphyllodes respublica*, since I introduced it in this place in 1849, has been described in detail and figured under the name of *Paradisaea wilsonii* in the Journal of Philadelphia. Some doubts have arisen as to the identity of the two species, so that to put the Americans (who have the happiness of possessing the type in all its splendour) in a better position to judge, I am publishing the notes taken on the imperfect example which I had only for a moment, hitherto unrecorded as: Some-

what in the middle between *Diphyllodes* and *Cicinnurus* as to the twisted tail feathers. About the size of *D. magnifica*, head dusky, yellow nuchal plumes definitely shorter; back from the nape red with black marginal feathers."

Sclater went to America, and visiting the Museums, published a commentary some three years later; referring to the Philadelphia collection he wrote: "is also fortunate in possessing amongst its complete series of *Paradiseidae* the only known specimen of the splendid second species of the genus *Diphyllodes*. American naturalists were quite unaware when they named this bird that Prince Bonaparte's characters of his *Lophorina* (!) *respublica* were taken from the self-same example. And seeing that even after the correction of the error in the generic appellation the descriptive phrase given by the Prince is positively erroneous, and such as the bird cannot by any possibility be recognised by; I must say I think it very questionable whether we ought not to employ Cassin's name *wilsonii* for this species, although certainly subsequent in time of publication to Prince Bonaparte's term *respublica*."

Possibly there will be still further argument, but as the diagnosis of *respublica* is not in any sense pertinent to this species it must be disregarded whatever the intent of the author may have been, and the correct name *wilsonii* used.

Some seven years later Bernstein discovered the bird at Waigiou, and, knowing nothing of the blundering and wrangling about the unique skin in America, he described his find as a new species of a new genus, *Schlegelia calva*, alluding to the bare head. Therefore the proper name will be *Schlegelia wilsonii*, but the vernacular to be used may be Bare-headed in preference to Republican. It is of great interest to see that the female has developed the bare head while retaining other-

wise the general coloration of females of the King Series.

This is a long history about a little bird, but there is nothing much on record otherwise. The genus *Schlegelia* contains one species only and may be described: The bill is rather long, strongly compressed laterally, culmen keeled, slightly arched, tip decurved, posteriorly notched; nasal groove entirely filled with tuft of feathers (nostril visible in female), interramal space small, feathered, gonys very long, semi-keeled anteriorly. The posterior half of the crown and the back of the head naked from hind part of eye save for narrow bands of feathers crossing each other (and this occurs also in the female). The wing with the first primary about half the length of the second, the third longer, the succeeding four longest about subequal and the secondaries long. The first primary narrow, pointed, the others pointed, the secondaries broad, round tipped, longer than the second primary, and decreasing inwardly. The tail is short and emarginate, the feathers broad and square, squarish ended, the two central feathers long, with very narrow webbing, crossing in a wide curve. The legs short, feet medium, the front of the leg smooth, the back bilaminate; the front toes thin, the mid toe longest, the outer longer than the inner, claws small, the middle toe and claw longer than the hind toe and claw, though the hind toe is stouter. The male may be described as to coloration thus: the top of the head and throat velvety black, the bare head bright blue, back of nape black followed by a triangular yellow nape frill with square cut ends, the back scarlet edged with black, upper tail coverts and tail feathers deep brown. The wing feathers brown, the coverts brown with darker tips, the secondaries with the outer margins red, the width of red increasing inwards. Succeeding the black

throat there is a large breast-plate of silky emerald green feathers with only a small blue-black abdomen uncovered; near the top of the breast-plate there are a few spots of blue, and the marginal feathers are tinged with blue. The bill is black, the eye brown, the legs blue, the bill measuring about 20 mm., the wing 96 mm., the tail 42 mm., the central feathers said to be 145 mm., tarsus 25 mm. The female has the bare head, the anterior portion of the head dark silvery brown, the back olive brown, rump less olive, tail feathers tinged with red, the feathers longer, narrower with rounded tips, square, the primaries paler brown, the secondaries rufous margined, the chin, cheeks and throat minutely speckled with black on a brownish white ground, the rest of under-surface fawnish closely barred with narrow brown bars, the under wing lining paler. The bill and leg measurements about the same, the wing shorter, the tail longer 56 mm. The immature is said to be similar in plumage to the adult female, whatever the sex may be. The display of this bird has been reported thus: The bird, after hopping about actively for a short time, holds itself stiffly stretched upwards, the feathers of the face appearing depressed, giving a coloration like that of black velvet when the pile is pressed; the breast, owing to the position of the incidence of the light, seems black, with red reflections. The bird jerks the head slightly from side to side, and emits a low, faint, whistling noise, best compared to the sound produced by a child with a toy railway-carriage wheel in its mouth! On one occasion the feathers of the neck were raised at this stage.

The notes change somewhat and become louder; the jerking of the head ceases and the beak is opened and closed several times (often three). As the beak is opened, the feathers of the head are moved to cause them to assume their normal glossy intense black, which contrasts vividly with the light green of the mouth. Quite suddenly the bird retracts the head and neck, elevating the breast and expanding the "shield," which is now seen to be bright green; in the "bay" at the upper margin of the shield, which is roughly bean-shaped, is the head, the blue crown just showing and two green spots appearing behind and above the base of the bill. The bird remains thus, motionless and silent, for a brief time, and then suddenly thrusts itself forward again almost into the first position, which it frequently resumes forthwith. On two occasions the bird was seen to open and close its beak in this position. The back display is a much less elaborate affair. The bird bends down the body to a position parallel with the perch and depresses the head, standing broadside on to the observer. The head is then slowly moved from side to side. It suddenly turns and resumes the frontal display. A mirror was presented before the birds. Both birds adopted an attitude similar to that of a displaying cock-sparrow, but fluttering the wings much more rapidly. One viciously attacked the image in the mirror if the glass was brought too near, and made frantic efforts to get through the wires, squawking excitedly the while. The other was frightened after the first occasion and merely hopped nervously from perch to perch.

TRUE BIRDS OF PARADISE

Subfamily *Paradiseinae*

Plate xvii, Figs. 1 and 2

THESE are the forms agreeing with the first Bird of Paradise brought to Europe (as already noted) by the surviving vessel of the fleet which set out under Fernando Magalhaens (commonly known as Magellan) and after rounding Cape Horn and crossing the Pacific (so named by Magellan) Ocean reached the Philippines. Here the leader was killed and one vessel, appropriately named "Vittoria", under the leadership of Sebastien del Cano, managed to return to Spain, having circumnavigated the globe for the first time. The date of return was September 6, 1522, just over four centuries ago. But among the riches and rarities brought back were some half dozen Birds of Paradise skins received from the natives of Batjan, the two to be duly recorded being a present from the King of Batjan to the King of Spain. These were received while the vessel was at Tidore and the birds were apparently Aru Island skins. For how many centuries these birds had been used for barter is quite unknown, but they probably reached India and China a very long time before they were seen in Europe. However, they soon became well known, as within a few years they were being illustrated in Natural History works, and two kinds, a Greater and a Lesser, were distinguished.

The general features of this well known bird show a straight beaked bird about the size of a Dove with the wings, back and tail of a bright chestnut, the head with short compact yellowish feathering, a frontal band of bright dark green, and a throat patch of iridescent yellow green small metallic-like feathers. The rest of the under-surface is vinous red, but from

the sides of the body spring long feathery plumes of mixed fawn and yellow. While in repose these feathers hang down, and while flying they float behind, but at certain times the bird goes into display, and these feathers can be thrown backward into a fountain-like display. The feathers of the tail are normal save the two central ones, which lengthen into very long wire-like threads. These side feathers were the desirable ones and the birds were deprived of their legs and wings to save space and trouble in packing.

Here follows the account by Valentyn as translated by Forster: "The greater Paradise-bird is generally about two feet in length. Head small; beak the length of the head; hard, pale-coloured. Head and nape of neck yellow. Space round the eyes black; neck beautifully resplendent with very soft, shining, emerald-coloured feathers; those of the breast, equally soft, of a pale yellowish-grey. Large chestnut-coloured wings. Back covered with the scapulars elongated, stiff, narrow, pale brown, very much resembling the loose feathers of the ostrich. These expand while the bird flies; and therefore it is easy for him to remain in the air. On the sides of the breast and belly are bundles of feathers, much shorter than the anterior ones, stiff, gold-coloured. From the rump arise two stiff feathers of great length, naked in the shafts, terminated with radiated plumes. In size it little exceeds the blackbird. Feet short, with four strong toes. The inhabitants of Ternate call this species Burong Papua, Papua birds, and sometimes Manu-co-dewata, and also Soffü, or Sioffu. The Amboynese call

them Manu-key-aru, birds of the islands Key and Aru, because the people of these islands bring them to Banda and Amboyna for sale. The Aruans give them the name of Fanaam. In fact, these birds are not found in the island Key, which is about 50 miles eastward of Banda, but are met with in the Aru islands (which are 15 miles further to the east than Key) at the dry season of the western monsoon, and return to New Guinea at the commencement of the rainy season, as soon as the east wind begins to blow. They fly in flocks of about 30 or 40, led by a bird which the Aruans call King, but which is altogether distinct from the lesser Bird of Paradise. This leader is black with red spots, and constantly flies higher than the rest, which never separate from it, but immediately when it settles, settle too, whence they frequently perish, for if the leader settles on the ground, they are not able to rise on account of the peculiar structure of their feathers. Nor can they fly with the wind, for in that case their very long loose feathers would be totally disordered; they therefore always fly against the wind, and carefully abstain from flight in a storm, which often throws them to the ground. While flying they are noisy, like starlings; but their cry rather resembles the croaking of ravens, and is particularly audible, when in windy weather the encumbrance of their feathers brings them into imminent danger of falling to the ground. In the Aru islands they perch on the highest trees, especially on those of the small-leaved Waringha with red fruit, on which they chiefly subsist. They are taken by the inhabitants with bird-lime, snares, or blunt arrows. But though many fall alive into the fowlers' hands, they are immediately killed, and after embowelling, and generally cutting off their feet, they are fumigated with sulphur, and dried, in which state they are sold, for half a dollar in Banda, but

in Aru they may be purchased for a large nail or piece of iron. The Dutch ships frequenting the sea between New Guinea and Aru (a distance of 18 or 20 miles) not unfrequently see flocks of Paradise-birds crossing the sea from one to the other of these places, but always against the wind. If a more tempestuous gale than usual rises during their flight, they seek the upper and calmer regions of the air, and thus continue their course. The natives fasten these birds to their helmets in place of crests, in real and mock fights; and often tie the whole or part of the skins to their swords. During the eastern monsoon their very long feathers fall; and in the western monsoon, within the space of four months, as the Aruans report, they are replaced by new ones."

Wallace's classical account may be here reproduced, as it refers to the Aru Island bird and nothing much has been since written about it: "The Great Bird of Paradise is very active and vigorous, and seems to be in constant motion all day long. It is very abundant, small flocks of females and young males being constantly met with; and though the full-plumaged birds are less plentiful, their loud cries, which are heard daily, show that they also are very numerous. Their note is 'Wank-wank-wank-wok-wok-wok', and is so loud and shrill as to be heard at a great distance, and to form the most prominent and characteristic animal-sound in the Aru Islands. The mode of nidification is unknown; but the natives told me that the nest was made of leaves placed on an ants' nest or on some projecting limb of a very lofty tree, and believe that it contains only one young bird. The egg is quite unknown, and the natives declared they had never seen it; a very high reward offered for one by a Dutch official did not meet with success. They moult about January or February; and in May, when they are in full plumage, the males assemble early in the morn-

ing to exhibit themselves. This habit enables the natives to obtain specimens with comparative ease. As soon as they find that the birds have fixed upon a tree on which to assemble, they build a little shelter of palm leaves in a convenient place among the branches; and the hunter ensconces himself in it before daylight, armed with his bow and a number of arrows terminating in a round knob. A boy waits at the foot of the tree; and when the birds come at sunrise, and a sufficient number have assembled, and have begun to dance, the hunter shoots with his blunt arrow so strongly as to stun the bird, which drops down, and is secured and killed by the boy without its plumage being injured by a drop of blood. The rest take no notice, and fall one after another till some of them take the alarm."

It will be recalled that Pennant noted that a living Bird of Paradise had been brought to England some time before 1790. Lesson in 1828 recorded that he saw at Amboina two Birds of Paradise which had been kept more than six months by the principal Chinese merchant there. They were always in motion, and were fed upon boiled rice, but they were especially fond of cockroaches.

Dr. George Bennett, later to become a most respected member of the community at Sydney, visited Macao on the Chinese coast on the 1st October, 1833. He reported that the great object of attraction at Macao was the splendid aviary and gardens of T. Beale, Esq. He then retailed the well-known history of the birds, which need not concern us, but added a good account of the bird in captivity: "The specimen in the possession of Mr. Beale is a fine male, and was at the time I beheld him arrayed in his full and splendid plumage; he is enclosed in a large and roomy cage, so as not, by confinement, to injure in the slightest degree his delicate and elegant feathers. For the delicacy and

harmony in the arrangement of the colours in this bird, as well as its remarkably light and delicate appearance, it may well be named the Bird of the Sun, or of Paradise, for it surpasses in beauty the whole of the feathered creation, appearing more like a celestial inhabitant than one of earth. Although the bird has been nine years in Mr. Beale's aviary, yet it does not exhibit the appearance of age, but is lively and healthy. The neck of this bird is of a beautiful and delicate canary yellow colour, blending gradually into the fine chocolate colour of the other parts of the body; the wings are very short, and of a chocolate colour. Underneath them, long, delicate and gold coloured feathers proceed from the sides in two beautiful and graceful tufts, extending far beyond the tail, which is also short, of a chocolate colour, with two very long shafts of the same hue proceeding from the uripigium. At the base of the mandibles the delicate plumage has during one time (according as the rays of light are thrown upon it) the appearance of fine black velvet, and at another a very dark green, which contrasts admirably with the bright emerald of the throat. There is nothing abrupt or gaudy in the plumage of this bird; the colours harmonise in the most elegant manner, and the chasteness does not fail of exciting our admiration. The mandibles are of a light blue; irides bright yellow; and the feet of a lilac tint. (This is the first description of a living bird.) This elegant creature has a light, playful, and graceful manner, with an arch and impudent look; dances about when a visitor approaches the cage, and seems delighted at being made an object of admiration; its notes are very peculiar, resembling the cawing of the raven, but its tones by far more varied. It has been stated that during flight they cry like starlings. During four months of the year, from May to August, it moults. It washes itself regu-

larly twice daily, and after having performed its ablutions, throws its delicate feathers up nearly over the head, the quills of which feathers have a peculiar structure, so as to enable the bird to effect this object. Its food, during confinement, is boiled rice, mixed up with soft egg, together with plantains, and living insects of the grasshopper tribe; these insects when thrown to him, the bird contrives to catch in its beak with great celerity; it will eat insects in a living state, but will not touch them when dead. I observed the bird, previously to eating a grasshopper, given him in an entire or un mutilated state, place the insect upon the perch, keep it firmly fixed with the claws, and, divesting it of the legs, wings, etc., devour it, with the head always placed first. The servant who attends upon him to clean the cage, gives him food, etc., strips off the legs, wings, etc., of the insects when alive, giving them to the bird as fast as he can devour them. It rarely alights upon the ground, and so proud is the creature of its elegant dress, that it never permits a soil to remain upon it, and it may frequently be seen spreading out its wings and feathers, and regarding its splendid self in every direction, to observe whether the whole of its plumage is in an unsullied condition. It does not suffer from the cold weather during the winter season at Macao, though exposing the elegant bird to the bleak northerly wind is always very particularly avoided. The sounds uttered by this bird are very peculiar; that which appears to be a note of congratulation resembles somewhat the cawing of a raven, but changes to a varied scale in musical gradations as he, hi, ho, haw, repeated rapidly and frequently, as lively and playfully he hops round and along his perch, descending to the second perch to be admired, and congratulate the stranger who has made a visit to inspect him; he frequently raises his voice, sending forth notes

of such power as to be heard at a long distance, and as it would scarcely be supposed so delicate a bird could utter; these notes are whock, whock, whock, whock, uttered in a barking tone, the last being given in a low note as a conclusion. A drawing of the bird, of the natural size, was made by a Chinese artist. This was taken one morning to the original, who paid a compliment to the artist by considering it one of his own species. The bird advanced steadfastly towards the picture, uttering at the same time its cawing congratulatory notes; it did not appear excited by rage, but pecked gently at the representation, jumping about the perch, knocking its mandibles together with a clattering noise, and cleaning them against the perch, as if welcoming the arrival of a companion. After the trial with the picture, a looking-glass was brought, to see what effect it would produce upon the bird, and the result was nearly the same; he regarded the reflection of himself most steadfastly in the mirror, never quitting it during the time it remained before him. When the glass was removed to the lower, from the upper perch, he instantly followed, but would not descend upon the floor of the cage when it was placed so low. It seemed impatient, hopping about without withdrawing its gaze from the mirror, uttering the usual cawing notes, but with evident surprise that the reflected figure (or, as he seemed to regard it, his opponent) imitated so closely all his actions, and was as watchful as himself. There was, however, on his part, no indication of combativeness by any elevation of the feathers, nor was any irritation displayed at not being able to approach nearer to the supposed new comer from his own native land. His attention was directed to the mirror during the time it remained before him, but when removed he went quietly and composed himself upon the upper perch, as if nothing had

excited him. One of the best opportunities of seeing this splendid bird in all its beauty of action, as well as display of plumage, is early in the morning, when he makes his toilet; the beautiful sub-alar plumage is then thrown out and cleaned from any spot that may sully its purity, by being passed gently through the bill; the short chocolate-coloured wings are extended to the utmost, and he keeps them in a steady flapping motion, as if in imitation of their use in flight, at the same time raising up the delicate long feathers over the back, which are spread in a chaste and elegant manner, floating like films in the ambient air. In this position the bird would remain for a short time, seemingly proud of its heavenly beauty, and in raptures of delight with its most enchanting self; it will then assume various attitudes, so as to regard its plumage in every direction. I never yet beheld a soil on its feathers. After expanding the wings it would bring them together so as to conceal the head, then, bending it gracefully, it would inspect the state of its plumage underneath. This action is repeated in quick succession, uttering at the time its croaking notes; it then pecks and cleans its plumage in every part within reach, and throwing out the elegant and delicate tuft of feathers underneath the wings, seemingly with much care, and with not a little pride, they are cleaned in succession, if required, by throwing them abroad, elevating and passing them in succession through the bill. Then turning its back to the spectator, the actions above-mentioned are repeated, but not in so careful a manner; elevating its tail and long shaft feathers, it raises the delicate plumage of a similar character to the sub-alar, forming a beautiful dorsal crest, and throwing its feathers up with much grace, appears as proud as a lady dressed in her full ball-dress. Having completed the toilet, he utters the usual cawing notes, at the same time look-

ing archly at the spectators, as if ready to receive all the admiration that it considers its elegant form and display of plumage demands; it then takes exercise by hopping in a rapid, but graceful, manner, from one end of the upper perch to the other, and descends suddenly upon the second perch, close to the bars of the cage, looking out for grasshoppers, which it is accustomed to receive at this time. Should any person place his finger into the cage the bird darts at it rapidly; if it is inserted and withdrawn quickly, the slightly-curved extremity of the upper mandible causes the intruder to receive a sharp peck, but if the finger is placed quietly in the cage, close to the beak of the animal, he grasps and thrusts it out, as if hinting that he dislikes its intrusion. His prehensile power in the feet is very strong, and, still retaining his hold, the bird will turn himself round upon the perch. He delights to be sheltered from the glare of the sun, as that luminary is a great source of annoyance to him, if permitted to dart its fervent rays directly upon the cage. The iris frequently expanding and contracting, adds to the arch, wicked look of this animated bird, as he throws the head on one side to glance at visitors, uttering the cawing notes, or barking aloud, to the astonishment of the auditors, who regard the bird as being in a very great rage at something or other beyond their conception. Having concluded, he jumps down to the lower perch in search of donations of living grasshoppers, seemingly in the most happy and good humoured manner. The bird is not at all ravenous in its habits of feeding, but it eats rice leisurely, almost grain by grain. Should any of the insects thrown into his cage fall on the floor, he will not descend to them, appearing to be fearful that in so doing he should spoil his delicate plumage; he therefore seldom or ever descends, except to perform his ablutions in the pan of water placed at

AUGUSTA VICTORIA
BIRD OF PARADISE

(*Paradisea augustaevectoriae*)

One-third natural size

1
MALE

RED-PLUMED
BIRD OF PARADISE

(*Paradisea raggiana*)

One-third natural size

2
MALE

FLY RIVER
BIRD OF PARADISE

(*Paradisea novaeguineae*)

One-third natural size

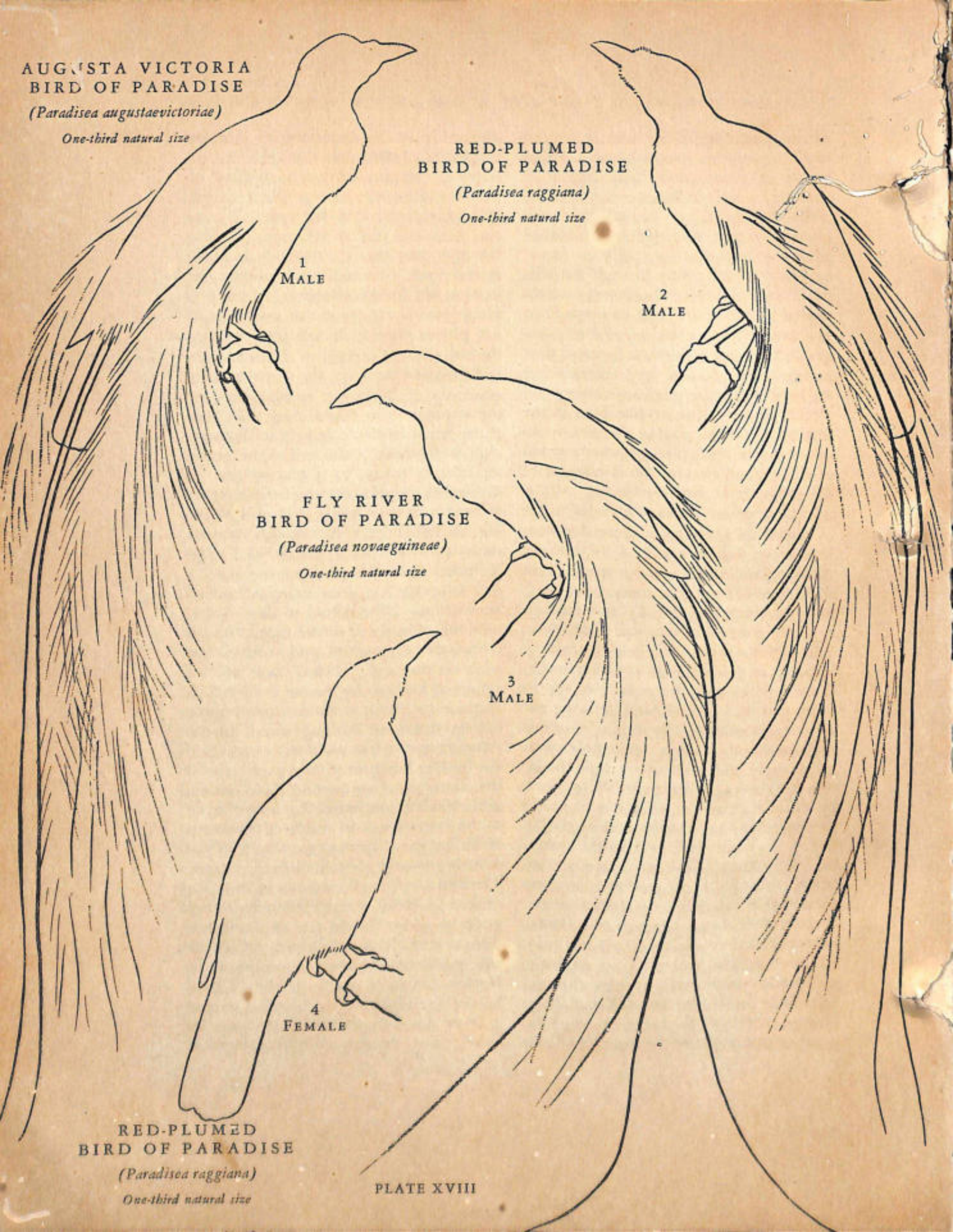
3
MALE

4
FEMALE

RED-PLUMED
BIRD OF PARADISE

(*Paradisea raggiana*)

One-third natural size





Lilian Medland

the bottom of the cage expressly for his use."

The two long 'wires', the middle tail feathers, do not always grow at the same rate and appear to lengthen with age. Some birds show them at almost their full length, but with a long oval feathery tip, while in the very oldest there seems to be no feathery tip at all. Further, when they begin they show a quite appreciable webbing which soon tapers and the 'wire' becomes almost bare, but under a lens minute barbs may still be distinguished. In rare cases even a pair of supplementary 'wires' may be produced through some mishap to the basal origin. It should be noted that while the normal feathers appear in a row, ten in number, the two central ones seem to arise above them from a small separate pocket. It is from some abnormality in this pocket that the supplementary 'wires' arise, and these are always additional to the normal ten. In no case has any of the normal series been found to develop into 'wires'.

Von Rosenberg eighty years ago reported that rarely in the Aru Islands birds were found with three 'wires', and that these were called 'Radjahs' by the natives. More recently de Haan noted a specimen with four 'wires', and upon his publication Rothschild stated that this was not so very rare, and that he possessed a Magnificent with four fully developed middle tail feathers or 'wires'. (De Haan, *Ibis*, 1920, pp. 720-722, text—figs. 1, 2, July.)

The preceding notes refer to the Aru Island Bird of Paradise, which is the largest and the type of the genus. Early the Lesser Mainland Bird was separated, and owing to its very different plumage changes there has never been any confusion with these two, though the ornamental side plumes are similar, yellow and white. From the island of Waigiou a bird with splendid red plumes was reported,

but it was early seen that it belonged to a different group, the quaint tail streamers drawing attention to the many differences to be noted. However, at the far eastern end of New Guinea there was discovered a typical Bird of Paradise with red side plumes, and thenceforward confusion grew as the hinterlands were explored and new intermediate forms were procured. Owing to the prevalence of the racial or sub-specific theory all these, save *minor* and a very different island form, were classed together as subspecies of *apoda* and appear as such in the latest list. Reconsideration scientifically will dissipate this fog, but much sun will be necessary, and this is an attempt to let a little light on to the subject. First the Aru Island form must be left on its island home, as it is sufficiently distinct in every detail, and there does not seem to be any variation in its size, coloration, etc. All the mainland birds are smaller and these are separable also into species, omitting the very distinct island form which inhabits a group of far eastern islands. Thus there are three about which there has been little or no confusion, and three are left for discussion of their status and that of their so-called hybrids and satellites. It must be remembered always that these problematical forms have been created in Museums by workers handling skins from more or less unknown localities, and if ordinary birds had been under examination, instead of these attractive ones, little notice would have been taken of them without corroboration of series and localities.

Now the Red-plumed appears to be constant and separable always and lives alongside some of the so-called subspecies. Ignoring these for the moment there are left *augustaevictoriae*, *novaeaguineae*, without the remaining questionable forms such as *granti*, *intermedia*, *sororia*, *mixta*, *subintermedia*, *luptoni*, *maria*, *duivenbodei* and *salvadorii*.

These will be noted in their appropriate places, but the outstanding features of the species recognised are:—

Paradisea apoda: Largest, head alone yellow, no throat band, back and wings without any yellow, ornamental plumes yellow and buffy white, female coloration dark below.

Paradisea novaeguineae: Smaller, yellow throat band, back and wings with yellow, ornamental plumes yellow and white, dark breast cushion.

Paradisea augustae victoriae: Smaller, yellow throat band, back yellowish with two yellow wing bars, ornamental plumes

reddish orange to crimson, dark breast cushion.

Paradisea raggiana: Smaller, yellow throat band, no yellow on back, on yellow wing bar, ornamental plumes bright red, dark breast cushion.

Paradisea decora: Smaller, no throat band, back and wing coverts yellowish, ornamental plumes bright red with small ones inward black tipped, pink below.

Paradisea minor: Smaller, no throat band, back yellow, two yellow wing bars, yellow and white ornamental flank plumes, no breast cushion, female white below.

THE FLY RIVER BIRD OF PARADISE

Plate xviii, Fig. 3

This form has puzzled me more than any other, as it has gained a place in literature without any clear cut description or figure. It was introduced by Salvadori as a variety only of *apoda* with the simple words: "Examples in perfect plumage, similar to those from the Aru Islands but a little less. Wing 208 mm., bill 34 mm." This was from the Fly River and then he made notes of many specimens as apparent hybrids with *raggiana*. Apparently up to then all yellow-plumed birds found on the mainland had been regarded as the Lesser Bird, which was known to be very distinct from its plumage changes and had been known from the earliest times.

Sharpe recognised it as a species, writing: "This species represents on the mainland of New Guinea the true *Paradisea apoda* of the Aru Islands; but Count Salvadori points out that it is a distinctly smaller bird, the chestnut colour of the male being brighter and more vinaceous, the breast darker blackish brown, the median and greater wing coverts often more or less golden, though this colour is obsolete in some individuals. So far *Paradisea novaeguineae* has only been

found on the Fly and Alice Rivers in Southern New Guinea. Here D'Albertis obtained a large series, and Count Salvadori points out that in the lower districts of the Fly River the species is absent and is replaced by *Paradisea raggiana*. It appears not to be found at Hall Bay, and it is probable that the species has a somewhat limited range in Southern New Guinea. Many specimens from the Fly River and the Alice are recorded by Count Salvadori in his 'Ornitologia della Papuasias' as undoubted hybrids between *Paradisea raggiana* and *P. novaeguineae*. Besides the possession of characters which are intermediate between the two forms, the Count records a variation in the colour of the flank plumes in these hybrids ranging from yellow to orange and bright orange red. I have not considered it necessary to give a figure of this species, as the characters for its separation from *P. apoda* are very slight, and the smaller size of the New Guinea bird seems to be the best mark of difference."

The British Ornithologists' Union Expedition 1910-1913 collected a long series from the Mimika, Utakwa, etc., Rivers

and these were recorded by Ogilvie-Grant as follows: "Adult males in full plumage were obtained between the 28th July and 7th January. The moult evidently extends over a considerable period, for birds with moulting heads and half grown side-plumes were killed in September, October and November. It would seem that in a wild state the male takes at least five years to assume the adult plumage—1st plumage brown, like that of the female; no trace of metallic plumage on the head, middle pair of tail feathers not longer than the outer pairs. 2nd plumage similar to the above. 3rd plumage head and neck as in the adult, but the chest scarcely darker than in birds in the first and second years' plumages; middle tail feathers similarly coloured, but half as long again as the outer pairs, webbed on both sides to the tip, but with the vanes much narrower along the middle third. 4th plumage as in the third plumage but the chest is very deep chocolate brown glossed with purplish and the lengthened middle pair of tail feathers is replaced by wires, as in the adult; there is still no trace of the ornamental side plumes. 5th plumage as in the fourth plumage, but with long ornamental side plumes. The bird is now in adult plumage, but the side plumes are not so long or so fully developed as in the sixth and subsequent years. As might be expected, these changes are sometimes retarded in captivity when the bird is not taking exercise or receiving its proper diet." Claude Grant's notes were added: "Was only observed in what may be termed the middle belt, that is to say, it was not seen near the coast and only extended on to the very first foothills of the mountain-range. Its call and habits appear to be very similar to those of *P. apoda* and the adult males were seen sporting themselves in the taller trees, no fewer than eight being observed on one tree by one of the men."

It will be noted that the bird has a breast cushion, wing bars and yellowish back, all characters distinguishing it completely from the larger insular *apoda*. No mention is made of variation in plume coloration by Ogilvie-Grant, and the Archbold Expedition to the Upper Fly reported that they found no signs of interbreeding in the localities where they collected.

The conclusion is that there is a distinct species of *Paradisea (novaeguineae)* ranging from the Mimika River eastwards to the Fly River with a breast cushion, wing bar, and yellowish back, the flank plumes being yellow and white, thus being like the Lesser above but different below. But Rothschild described a *Paradisea mixta*, writing: "Male intermediate between *Paradisea minor*, *minor* Shaw and *P. apoda novaeguineae* D'Alb. & Salvad. It has the back and head of *P. m. minor*, but the green frontal band is narrower. The breast cushion is similar to *P. a. novaeguineae*, separate from the lower parts consisting of curled feathers. The ornamental side-plumes are those of *novaeguineae*, not similar to *minor*. Habitat? The bird may be a hybrid between *minor* and *novaeguineae*, but it is not probable." This introduces as another character the difference in the flank plumes, but does not seem distinctive. Still another complication was introduced by Lowe when he proposed *Paradisea apoda luptoni*, explaining: "The type specimen of this apparently new subspecies or hybrid was taken from a box of sixty or more similar skins seized by H.M. Customs at Newhaven on 25th February (1923). The name is based solely on coloration, and is bestowed in order to call attention to what may be an interesting instance of hybridism, the colour of the pectoral plumes being "clocked-egg" colour, that is to say, exactly intermediate between *P. a. raggiana* and *P. a. novaeguineae*. The colour of the upper

parts (mantle, rump and tail) are practically identical with *P. a. raggiana*. The type specimen is identical with a skin in the British Museum collection said to have been exported from the Merauke district by the Plume Trade." To this Rothschild replied: "Such birds have been known for the last forty-five years, having been discovered by Signor D'Albertis in 1877 on the Fly River and described by him and Count Salvadori in 1878. D'Albertis obtained 15 males and 4 females of these intermediate birds, showing all intergradations from yellow plumed birds like pure *P. a. novaeguineae*, but showing traces of

the yellow shoulder patch and collar of *P. a. raggiana*, to others with the almost pure red plumes of *P. a. raggiana*, but with obsolete or no yellow shoulder patches." Here Lowe apparently chanced on a local variation of *P. raggiana*, as he noted that sixty or more were similar. Rothschild confused this with the variable series regarded by Salvadori as hybrids, but it was overlooked that this series might have been composed of birds from different ranges and spurs, and this would account for the differences. This local variation will be again mentioned in connection with the Augusta Victoria.

THE AUGUSTA VICTORIA

Plate XVIII, Fig. 1

At the same time as he described the White-plumed Bird of Paradise Cabanis also named *Paradisea augustae victoriae*, and the bird was known as the Empress of Germany's Bird of Paradise. It was shortly described thus: "The forehead and throat shining green, the chin black; the chest feathers velvety purple black; all the rest of the under parts vinaceous, the flank plumes bright reddish orange; the top of the head and nape yellow, the remainder of the back with the upper tail coverts medially yellow, the sides and wing coverts washed with yellowish olive; wings and tail dull chestnut." There is nothing much in this description save the coloration of the "flank-plumes bright reddish orange" and "the remainder of the back with the upper tail coverts medially yellow", the locality being Kaiser Wilhelm's Land. The colour of the flank plumes separated it from the true Greater and Lesser Birds and the colour of the back from *raggiana*. Apparently this bird ranges eastward towards the Kumusi River with varying degrees of coloration of the flank plumes and has on this account received new names without much informa-

tion as to the habitat of the birds. Thus it was given a new name from the Kumusi River; then the typical form, through misinterpretation of the original description, was clearly renamed; while another name was regarded as being equivalent to the Kumusi River, and still another form inland from Huon Gulf was reported. It is possible that the variation is local and that all the birds from any district show similarly coloured flank plumes allowing for variation with age. It is fairly certain that the first plumes are shorter and weaker in colour and that with age the plumes become longer, denser, and more richly coloured.

De Vis' *intermedia* from the Kumusi River was separated: "Forehead, all the lower surface and the flank plumes as in *P. raggiana*, head, nape, back and middle of rump and upper tail coverts pale straw yellow; upper wing coverts broadly margined with same, the alar stripe so formed tapering off posteriorly, and separated from the back by the outer feathers of the mantle, which, like the greater coverts, are chestnut washed with yellow; wing, tail, and sides of rump and upper tail

coverts rather pale chestnut. Total length, 300 mm., wing 180 mm., tail 162 mm., culmen 38 mm., tarsus 36.5 mm. Distinguished from *P. augustae-victoriae* by the blood-red colour of the flank plumes, pure chestnut of the sides of the rump and upper tail coverts, and by the presence of the alar stripe. It is just possible that this form may be a hybrid between *raggiana* and *augustae-victoriae*, but the constancy of colouring shown by all of them militates strongly against the supposition." Twenty years later Menegaux re-described this bird as *P. raggiana sororia*, ignorant of De Vis' prior nomination; but upon attention being drawn to this he immediately accepted the identity. However, seven years before, North, misled by Sharpe's glorious figure in the *Monograph*, renamed the original *augustae-victoriae*, *granti*, and this further confused European ornithologists.

To complete the toll Rothschild proposed *Paradisea apoda subintermedia*, as "adult male differs from *P. a. intermedia* in the dull cinnabar scarlet, NOT brilliant crimson, of the nuptial side-plumes, thus approaching in colour *P. mariae*. The shafts of the inner two-thirds of the side-plumes are also a light salmon-orange, not orange-chrome as in *P. a. intermedia*. The shoulder stripe is also much smaller, owing to the less extent of yellow on the smaller wing-coverts. There also appears

to be less yellow on the rump than in *P. a. intermedia*. Nine males, inland from Huon Gulf. The new form is one of the *P. apoda* group with a large cushion of curled feathers on the breast."

The type of North's *granti* agrees in detail with the original illustration by Cabanis of *augustae-victoriae*, but not with Sharpe's figure, and is here illustrated as typical. Apparently the Augusta Victoria is in the process of selection, as there are so many minor variations known in connection with it, from the northern most typical orange-plumed *granti* to the southern *intermedia* with deep crimson plumes. A large series, from that north-eastern district, where there is no other species to hybridise with, shows variation in the throat band from a broad one to very narrow, almost obsolete; the yellow on the wing coverts may be present as distinct bars, spread over the feathers, or almost missing; the cushion may be narrow or broad, contrasting vividly or scarcely contrasting, and the plumes from red orange to crimson, sometimes even yellow below. These have not yet been tied up with definite localities, but they may represent populations of various inland ridges as sometimes a fairly constant series has been seen from one locality. Again as noted before it may be that the females which do not appear in old skin collections may show valid differences.

THE RED-PLUMED BIRD OF PARADISE

Plate XVIII, Figs. 2 and 4

The first note of the discovery of this beautiful and very distinct bird was published by Sclater, in *Nature*, Aug. 14, 1873, p. 306, reporting upon some new birds sent by D'Albertis, who called it *Paradisea raggiana*, writing: "This is a true *Paradisea*, nearly allied to the Greater and Lesser Birds of Paradise (*P. apoda* and *P. papuana*), but having the long lateral

plumes more of an orange-red, as in *P. rubra*. On the western coast of New Guinea opposite to Salawatty."

A few months later the account appeared in the Proceedings of the Zoological Society of London, where Sclater published D'Albertis' notes, reading: "The mutilated skins of this bird resemble those of the Red Paradise-bird of Waigiou, but

differ in some particulars. I procured them at Orangeisa Bay, where *P. papuana* and *P. apoda* are not known to the natives, judging by their surprise when I exhibited some skins of those species. Should the present bird prove to be new, I should wish it to be named after the Marquis Francis Raggi, a great lover of natural history, and especially of ornithology." Sclater added as a footnote: "The two imperfect skins of this species sent seem to prove that it is decidedly distinct from *P. rubra*, as supposed by Signor D'Albertis, and in fact more nearly allied to *P. apoda* and *P. minor*, having the two abnormal central rectrices rounded as in the two latter, and not concave with one side open as in *P. rubra*. But it agrees rather with *P. rubra* in the colour of the great lateral pectoral tufts, and in having a distinct though narrow yellow band (like the back) interposed between the green throat and dark breast. As regards the head, however, the green front is quite narrow as in *P. minor*. I have named this Paradise-bird *P. raggiana* in compliance with its discoverer's wishes."

When D'Albertis explored the Fly River he reported: "I was rather fortunate in my excursion into the mountains, for I found *Paradisea raggiana*, and obtained some beautiful specimens in full dress. In its voice, movements and attitudes it perfectly resembles the other species of the genus. It feeds on fruit, and I could find no trace of insects in the seven individuals which I prepared. It inhabits the dense forest, and is generally found near the ravines—perhaps because the trees on the fruit of which it feeds flourish in the neighbourhood of water. The female is always smaller in size than the male; and I find this sex less abundant, because, as I believe, it was the season of incubation. The female is more like the same sex of *P. apoda* than that of *P. papuana*. The young male is like the female, but often

recognisable by having distinguishable traces of the yellow collar which in the old male divides the green of the throat from the breast feathers. The irides are of a rather bright yellow, and the feet lead-colour with a reddish tinge. The long flank-feathers in individuals recently killed have a very bright tint, which they lose in a few days—even in a few hours. The two middle tail feathers are filiform, like those of *P. apoda* and *P. papuana*, and in no stage of development resemble those of *P. rubra*. These two feathers are not so long as in *P. apoda*, and about equal to those of *P. papuana*. Like its sister species, *P. raggiana* is an inquisitive bird, and often approaches from branch to branch within a few yards of the hunter, and remains motionless for some seconds to observe the pursuer, stretching out its neck, flapping its wings and emitting a peculiar cry, upon the sound of which other individuals come forward to join it. When one is wounded and cries out, many others come forward as if to protect it, and approach quite near, descending to the lowest boughs. The adult males frequent the tops of the highest trees, as Dr. Wallace observed in the other species, and as I also remarked in my former expedition."

Soon afterwards Ramsay reported: "This, certainly one of the most beautiful of its tribe, is the only species of the genus found near Port Moresby, its nearest locality is twelve miles inland on the banks of the Lalok River. They usually frequent the higher branches of the larger trees, but sometimes also those of smaller growth, in search of berries, their chief food, associating in troops of from 5 to 10 in number, young birds and females predominating. The adult males, easily found by their loud cry of 'Wock Wock' repeated some 10 or 12 times in succession, are rendered more conspicuous by their habit of elevating and spreading their plumes immedi-

ately after 'calling,' shaking them out as it were, with a continuous tremulous motion for two or three minutes. It was only after their feeding time in the morning that they were thus observed disporting themselves. I find that the young males resemble the females for at least the two first years, so closely, that the sexes cannot be determined without dissection. The first change is the darkening of the throat, then the change from dark chocolate to bright green, the frontal band or bar becomes darker, and finally deep dark green, and the velvety yellow feathers of the head take the place of the dull olive yellow of the young birds. After these changes, the two wire-like centre tail feathers appear, and attain their full length before the long flowing plumes on the side and yellow bar on the shoulders are full grown. I find apparently full-grown males, but without plumes, still having the centre two wire-like tail feathers of great length; this seems to argue in favour of the side plumes being shed every year, but I am inclined to the other view of the case as stated above. The *Raggiana* from the south-east end of the island are slightly larger in their dimensions than those obtained about Port Moresby on the Laloki River. The plumes are also longer, thicker and richer. This may be on account of the age of the individuals. The natives of Hall Sound, and in fact all along the coast, do a considerable trade in Paradise plumes, taking the birds in nets at night while roosting."

This bird became one of the best known, as the Australian collectors Broadbent, Morton, Goldie, Shaw, Blunden, as well as Hunstein and Forbes, procured many specimens in the south-east. One of the original two was beautifully figured by Elliot, placing the identity of the species beyond any doubt to everyone. Therefore it was bewildering to find it re-described as a subspecies of *Paradisea apoda* by

Mayr and Rand a few years ago. Their description reads: "Closely related to *raggiana*, but the male is distinguished by the completely brown back, lacking the yellow tips to the feathers of the upper back, and by the more bronzy green, less blue green gloss of the throat patch. The single female for comparison differs from a female of *raggiana*, taken at Annie Inlet, in lacking the yellow on the upper back and in having much less yellow, which is also duller, on the back of the head and neck, the black of the forehead extending farther back. *P. a. raggiana* is intermediate between *salvadorii* and *intermedia* De Vis."

The very feature used above for the new bird, the completely brown back, is characteristic of the true *raggiana* as shown by Elliot, and this was recognised by every succeeding worker. It was described from Orangerie Bay, and varies slightly in coloration between the Port Moresby area and Milne Bay as pointed out by Finsch and Meyer. "At fifteen miles in the interior from Port Moresby, according to Hunstein, this species is first met with, but does not occur on the Horseshoe Mountain. It extends to Basilisk Island and westward to Bentley Bay. Examples from Milne Bay seem to have the brownish violet breast shield rather darker and the parts immediately below also darker than examples from the Astrolabe Mountains. In the latter also there appears to be a yellowish nuance on the green throat feathers, instead of the bluish nuance of the former. The Milne Bay specimens measure about half a millimetre (*recte* centimetre) more in the length of the wing, and also show a rather more yellowish nuance on the undersides of the wings and tail when the direction of the eye is parallel to the light falling upon it. But all these apparent differences are very slight, and there is not sufficient evidence of their constancy to separate the birds as

local forms. At the same time it is right to notice these small differences occurring in neighbouring localities in order to arrive at a correct knowledge of the variation of species in connection with geographical distribution."

As Mayr and Rand's *salvadorii* was a little distant from Orangerie Bay it may be later recognisable, but it may be noted that the specimens from the Fly River further west were not regarded as separable at all. A series from the Mt. Hagen district compared with birds from Milne Bay, the easternmost portion of the habitat of this species, shows such slight colour variation as to be regarded as negligible. The head may be a little paler yellow, the back a little duller, the cushion a little darker, but more differences may be seen in any two birds of *augustaevictoriae*.

This species lives alongside the Augusta Victoria and is very constant in every feature, throughout the ranges from Milne Bay to Mt. Hagen and the Fly River, apparently mainly on the south side of the central ranges.

While the display of the Blue Bird of Paradise is now well known, and that of the Greater Bird of Paradise has also been recorded for years, there seems no definite record that the latter swings upside down, or I may have missed it. In the Australian journal "Walkabout" is a natural description by A. W. Lauder which from its vivid phrasing should be saved: "We could hear the calls that came from the timber-clad mountains beyond the kunai. The penetrating notes reached us where we were camped, about a half mile from the group of feather-topped pines which marked the direction from whence came the calls. Crossing the couple of hundred yards of grass we reached the fringe of the forest and proceeded to hack our way in through the tangle of lawyer vines and bamboo. We were two, and the going was hard. The distinctive pines could no longer be

seen to guide us, and only occasionally did we hear the succession of notes which gave an indication of the way we must go. The Bird of Paradise confines itself to a small area—more often than not, it can be seen in the same tree day after day. We had found this so with the blue and the white birds, and were anxious to see if these were of another species and of the same habits. Progress was slow. We waded across a creek, and plunged through a stagnant patch of swamp. The call would come from right and then left. There was no more than about ten feet of our track cut in a straight line. Emerging in a small clearing we saw a thicket ahead, and behind it a tall, densely foliaged tree. Looking hopefully towards the tree we could see nothing, no sign of our quarry. Suddenly a female bird flashed out of it, and then was lost to sight. Spurred on by this we cleared a track to the tree, which stood in another clearing. A call came from close by—which tree? And there it was—a faint touch of colour among the leaves. The binoculars were as yet of no assistance. The bird sat motionless behind its cover, showing only the slightest movement with the exertion of its call. They seem to have a distaste for sunlight, as though afraid their colours may fade under it. It moved completely out of sight. Came a call of a rival male from somewhere in the forest and our bird answered. The cross-talk quickened, became excited and voluble. A third joined in the clamour—and a fourth. Then silence, broken now and then by a single note. The bird whose position we watched started to call again. Two females flew into his tree. A flutter of wings, bright colour that sent the butcher bird darting off into the jungle, and the Bird of Paradise flew into its place. The two females, one after the other, perched above it, and were joined by a third. The male bird sat while the females fluttered for pride of

place, he called again, a low clucking. The notes came faster and increased in volume. He swung upside down, holding the bough by his feet like a cocky in a cage. Plumage spread, he continued to swing. The din of feminine applause became deafening. They started to fight, angrily pecking at one another. He righted himself and drove one of the females from the tree; a second refused to leave the tree; the third he left alone. The calling continued while he again went through his trapeze performance. His audience became quiet except for occasional short bursts of approbation. His great height in the tree, easily eighty feet up, caused a severe pain in our necks as we watched. But enthralled, we could not lower our heads throughout the display, which lasted for a full ten minutes. We believed the bird to be the Empress Augusta, but insufficient knowledge made its classification uncertain. Perhaps a short description would be of interest. Its head 'cap' was the colour of moss on which the sun is shining. The bill was a light and beautiful blue. Its face was black, or possibly a deep green, and this colour ran to the mottled fawn of its neck. What at first appeared to be a black 'collar' was later seen through the glasses to be a ball, not unlike a beret 'pom-pom' of deep chestnut coloured feathers which stood straight out from the body—or had that appearance. The under-part of the body was fawn; and the plumes, long and filmy, were of a deep russet which lightened towards the end. The display ended, the male continued to sit on the same bough, and after a few minutes flew back to the tree in which we had first observed him. We would cheerfully have cut through ten

miles of jungle for what we had seen. A few days ago, at the same place, we saw a female excitedly flying about with a twig in her mouth, but seemingly uncertain as to what should be done with it. Whether it was merely wishful thinking or this is the nesting season we cannot yet tell."

This refers to Raggi's Bird of Paradise from the description of the bird and the locality was on the Kokoda Trail. Chalmers' and Wyatt's notes read, apparently Chalmers alone: "One morning we had camped on a spur of the Owen Stanley Range, and being up early, to enjoy the cool atmosphere, I saw on one of the clumps of trees close by six Birds of Paradise, four cocks and two hens. The hens were sitting quietly on a branch, and the four cocks, dressed in their very best, their ruffs of green and yellow standing out, giving them a large handsome appearance about the head and neck, their long flowing plumes so arranged that every feather seemed combed out, and the long wires stretched well out behind, were dancing in a circle round them. It was an interesting sight, first one then another would advance a little nearer to a hen, and she, coquette-like, would retire a little, pretending not to care for any advances. A shot was fired, contrary to my expressed wish; there was a strange commotion, and two of the cocks flew away, the others and the hens remained. Soon the two returned, and again the dance began and continued long. As I had strictly forbidden any more shooting, all fear was gone; and so, after a rest, the males came a little nearer to the dark brown and certainly not pretty hens. Quarrelling ensued and in the end all six birds flew away."

BLOOD'S BIRD OF PARADISE

(*Paradisea bloodi*)

One-third natural size

1
MALE

4
MALE

LESSER
BIRD OF PARADISE

(*Paradisea minor*)

One-third natural size

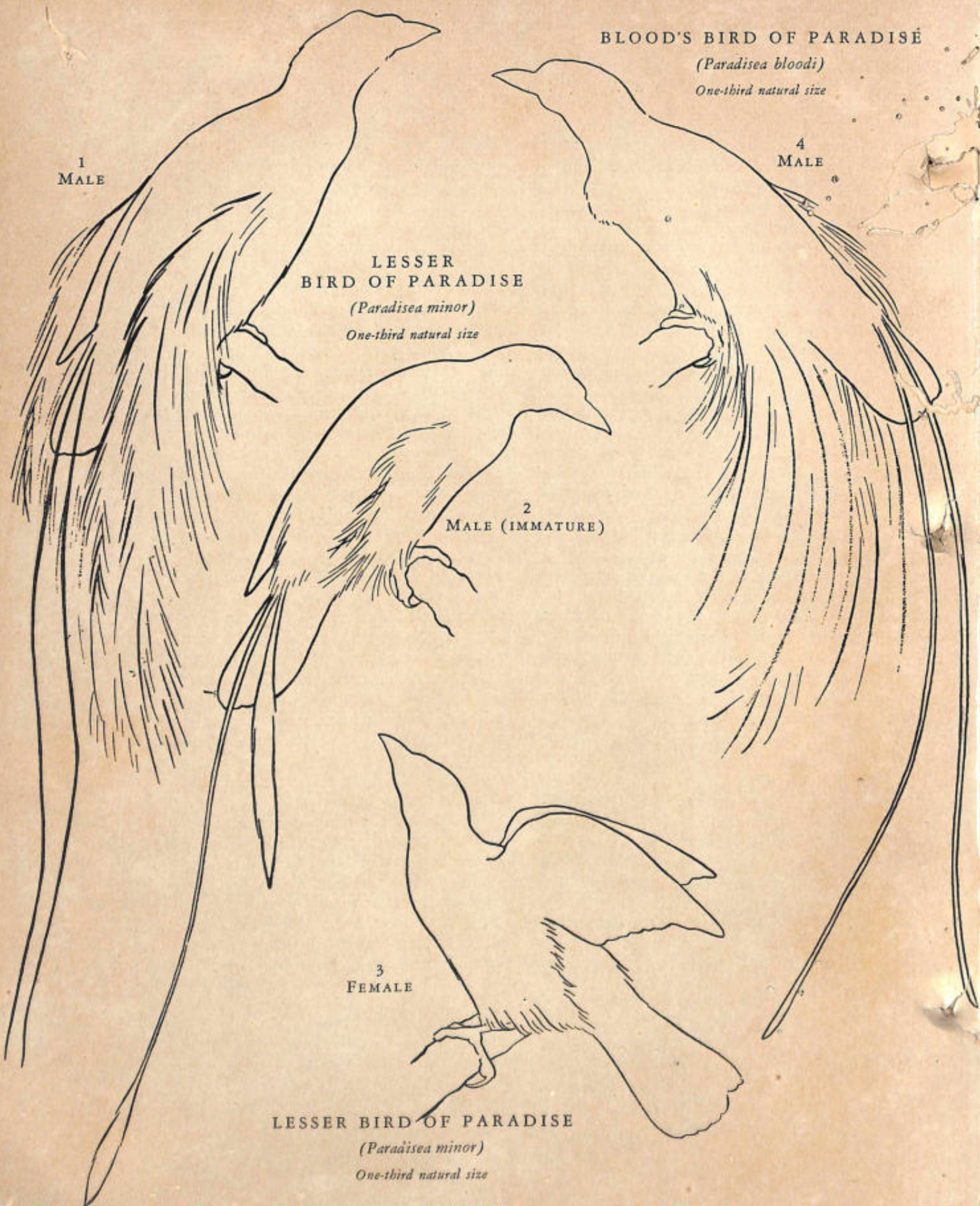
2
MALE (IMMATURE)

3
FEMALE

LESSER BIRD OF PARADISE

(*Paradisea minor*)

One-third natural size





Lilian Medland

THE LESSER BIRD OF PARADISE

Plate XIX, Figs. 1, 2 and 3

This bird was very early separated from the Greater on account of its smaller size and brighter plumes. Valentyn's report reads: "This species is about twenty inches in length. Beak, lead-coloured, paler towards the apex. Eyes, small and surrounded with black. Neck, emerald-coloured. Head and back of the neck, dusky-yellowish. Wings, small and chestnut-coloured. Breast and belly, brown. Back, yellowish-grey. Long scapulars, about a foot in length, and paler than in the former species; which is in general to be observed of all the splendid colours in this species. The long bare feathers of the tail are constantly rejected by the inhabitants. In other respects, this species has everything in common with the former. These birds also follow a leader; which, however, has more of a dark purple in his wings; but this leader is distinguished from the third and fourth black kinds (the Superb and Sixpenny). The Papuan inhabitants of the island Missowal (Mixoal, Maysol), relate that these Paradise-birds never migrate, but build nests in the highest trees where they are found by the Alsubris. The beak and neck are longer in the male than in the female. By the people of Tidore, and Ternate, this bird is called Toffu or Burong Papuwa (Papua-bird). By the Papuans it is named Shag or Shague. The people of East Ceran give it the name of Samaleik; but in the isle of Serghile, in New Guinea, it is called Tshakke. It was formerly believed that these birds were found in Gilolo or Halamahera, and the adjacent islands to the south and south-east; but it is now certain that they are peculiar to the Papuan isles. These extend from the southern extremity of Gilolo, and northern coast of Ceram, as far as the western part of New Guinea. The larg-

est of them are Missowal (Maysol) lying to the north of Ceram; and Salawatti, or Salawat, situated near the country or island of Serghile, in New Guinea. This last, in the earliest Portuguese maps, is improperly called Ceram, and is separated from New Guinea. These Paradise-birds perch on the highest trees of the mountainous region, and are killed with blunt arrows by the people of Missowal. Others relate that the natives medicate the water of which the birds are used to drink, with the India-berries, whereby they are rendered so stupid as to be taken by the hand. These birds commonly feed on the fruit of the Tschampeda-tree, which they perforate with their bills, and thus extract the kernels. It is fabled by some, that when these birds become weak with age, they fly a great height towards the sun, till they fall down dead. The Papuans, after killing and embowelling them, dry the cavity with a hot iron, and enclose them in a joint of bamboo, in order the better to preserve them."

The first European naturalist to see and report upon this bird was Lesson: "The small Emerald Bird of Paradise has the vivacious and agile movements and has much of the manners of a Crow. In the forests that it inhabits it seeks the summits of the tallest trees, and it descends to the lower branches to search for its food or to escape from the rays of the sun. It shuns the heat and loves the shade of the thick and bushy foliage of the teak-trees. It rarely leaves these trees in the middle of the day; and it is only in the morning and evening that it is seen seeking its food. Ordinarily, when it believes itself to be alone, it utters a sharp cry, frequently repeated, which can be imitated by the syllables roake, roake, roako,

strongly articulated. These cries, at the time of our sojourn in New Guinea in July, appeared to us to be a call for the females, which were in parties of twenty individuals and responded from the surrounding trees, in a similar manner to the love call. Never among these troops did we see more than one male strutting proudly in the midst of these plainly apparelled individuals, whilst he, plumed dandy, resembled a cock who shouts victory after having beaten a rival and gained the sovereignty of a poultry yard. Is the little Emerald Bird of Paradise, then, a polygamist? or is the disproportionate number of females owing to the continual chase after the males, which causes this scarcity, whilst the females are neglected and allowed to live in peace without fear of man, having only to protect themselves from their natural enemies, the beasts of the woods? Attracted by this roake, roako we found it easy in our expeditions to follow the birds, discover and kill many. The first one we saw astonished us so much that the gun remained at rest in our hand, so great was our surprise. We walked with care in the tracks made by the wild boars in the thick and leafy forests in the neighbourhood of Dorey, when a male of this species passed over our heads with graceful and soft flight, and seemed to us like a meteor, of which the fiery tail left behind it a long streak of light. When an unaccustomed sound strikes the ear of the bird its note ceases and its movements are suspended, so that it becomes absolutely passive and remains hiding in the deep foliage which conceals it from the view of the hunter; but if the sound continues, it soon flies away. It perches upon the highest branches of the loftiest trees of New Guinea, and it is very difficult to shoot without using long-range guns. When it is only wounded, it expires in the thickets; however, we happened one day to find, dying upon the banks of a

pond in the bed of a half-dried torrent, one of the birds which had been wounded the day before. It is, then, in the evening or, better, the morning that the hunter must be on the watch, after having carefully reconnoitred the trees filled with Birds of Paradise, soon foretold by their harsh and loud cry. At the time of our stay in this land (from the 29th of July to the 9th of August) these birds searched for the fleshy buds of the teak-trees; we always found insects in their crops."

Bartlett's account of a pair in captivity seems worthy of reproduction: "When the two Birds of Paradise first arrived at the Zoological Gardens, London, in April 1862, their plumes were quite short, only about five inches long. The birds had moulted, and the new feathers were growing in a thick bunch on each side below their wings. They appeared in good health, and were active and lively. I soon ascertained how fond they were of meal-worms and other insects; and they fed freely upon fruit, boiled rice, etc., a little cooked flesh was also acceptable to them. Their mode of hopping about from perch to perch and clinging to the bars or wires of the cage reminded one of a Jay or Jackdaw. They were fond of a bath, and were very careful in dressing and drying their fine plumes; these were about two months in growing to full perfection, and it was a charming sight to see them when in full plumage. When uttering their loud call the body was bent forward, the wings spread open and raised up, frequently over their heads, meeting the plumes, which were spread in the most graceful manner, every feather vibrating in a way that almost dazzled the sight. During this display the bird would become greatly excited and sometimes turn almost under the perch or branch, the head and neck being bent so low down. At this period we found they would not agree, but at

tacked each other; and we were therefore obliged to keep them separated by a wire division. They hopped about like Jays or Jackdaws, never ran like Starlings or Magpies, and when on the ground raised the points of the plumes so that they would not touch the earth. They soon became very tame, and would take food from the hand; and the sight of a meal-worm would bring them down from the perch immediately. The moult was extremely rapid, the fine plumes being thrown off in a few days; and these appeared to grow all at the same time in a bunch. It is therefore certain that these birds, after they attain the adult plumage, lose it only during the annual moult."

Although the Lesser Bird of Paradise has been known from the earliest times, and the males in full plumage are remarkably like those of the Greater Bird, they may provide a startling study in coincidental variation. The immature and female of this bird are very dissimilar in plumage coloration, and if they be very nearly allied our classification will become very difficult. In recent years it has been axiomatic that the immature of closely allied species should resemble one another closely, and this is continually seen to be true. Yet in this highly developed group the immatures prove to be very different in coloration, a startling innovation, as throughout the Rifle Birds, Long Tails, Sickle Bills, and even the King Birds, there has been a similarity in the juvenal plumage, while the males have differed very widely in size, colour, colour-system, and structure, as well as in adornments and ornamentation. It has been shown that females of such distinctly adorned birds as the Superb and Six-plumed have been confused by good ornithologists, and now is seen the curious case of the female and immature of this bird. To come to the point, the female of the Greater Bird has

been described and figured, just such a bird as would be indicated, and it will be noted that similar females occur in the cases of the Augusta Victoria, the Red-plumed and the Goldie Bird of Paradise. Of course the females of the Red, the White and the Blue are very different, as they do not superficially appear to belong to the restricted true Birds of Paradise. But it must be admitted that at first sight the female would be expected to fall into line with the females of the Greater, the Red-plumed, etc. Instead of which we see a white undersurface in the female and in the young male of the Lesser bird, and the growth of coloration on the under parts of the male without any change in the whiteness of the female.

The male Lesser Bird of Paradise has been described above, but the female is not much like the female of any other, and may be thus described. Head and throat brownish, nape yellowish, rest of upper-surface brown red washed on back only with greenish yellow, no wing bands, the central tail feathers shorter and narrow; all the under-surface white. The young male is a little different, the head yellowish, the back washed with yellow, the lower back, rump, upper tail coverts, wings and tail red brown, bend of wing yellow; two long central tail wires; a rather broad frontal band of emerald scales and a small velvety black throat patch, rest of throat minute emerald scales; very large maroon red dark cushion, abdomen and flank feathers white, thighs and under tail pinkish brown. Apparently a younger male is similar above, a little duller yellow, with only the indications of yellow on the bend of the wing, the throat and frontal band as above, but with only a spot of maroon below, all the under-surface otherwise being white. The tail feathers are interesting, as one of the central ones is long,

elongated, narrow, but the other very lengthened, narrower, with long spatulate tip.

Subspeciation is not very decided in this species, but four forms have been separated, mainly on almost inappreciable size differences. Thus the typical form from Arfak had a wing measurement of 177-189 mm., tail 130-136 mm., ornamental plumes 400-468 mm. Thereupon the Jobi Island form was separated as having wing 196-200 mm., tail 145-150 mm., ornamental plumes 530-610 mm. The eastern form

was separated as being smaller and slightly differently coloured, but both these characters are somewhat doubtful with the wing bar less distinct. The Mt. Hagen bird has two yellow bars on the wing coverts and the under-surface dark red brown. Hollandia birds were measured by Rand as wings 182-190 mm., in the female 159-164 mm., while a long series from the Sepik district recorded by Stresemann measured, wings of males 183-198 mm., females 150-167 mm., the ornamental plumes 200 to 500 mm.

MRS. REICHENOW'S BIRD OF PARADISE

Plate XI, Fig. 1

Professor Reichenow, Curator of Birds in the Berlin Museum, was a good ornithologist who specialised in African birds, and due to his position it fell to his lot to examine birds from New Guinea. He was quite unfamiliar with this avifauna, and therefore was compelled to treat the specimens merely as bird skins for comparative purposes. His results were not, as a whole, happy, though his conclusions must be treated with care.

The receipt of a new Bird of Paradise from the Finisterre Mountains in North-Eastern New Guinea allowed him to name it after Mrs. Reichenow, using her first name, so that *Paradisea maria* was thus described: "Distinguished from *P. minor* by the metallic green forehead and vertex, by the paler yellow on the occiput, mantle, back, and wing coverts, and by the reddish plumes of the train. Forehead and forepart of the crown, as well as the lores and forepart of cheeks and throat, metallic green; hind part of the head, nape, back, and lesser wing coverts pale straw yellow, lighter than in *P. minor*; greater wing coverts only narrowly washed with straw-yellow. The brown colour on the wings, tail and under-surface of body resembles that of *P. minor*. The orna-

mental feathers on the flanks have a yellow ground colour, washed with brownish red on the outer web, and especially on the inner one, afterwards becoming white with a brownish-red tint and then pure white at the tips; the shafts are partly yellow, partly reddish brown and white at their ends. Some of the outer flank plumes have a brownish-red outer edge near their bases, and this forms on the outspread feathers a continual red longitudinal stripe, whereas in *P. minor* it is formed of shorter and separate stripes of dark chestnut brown. Owing to the mixture of white and brownish-red the mass of the ornamental plumes has a kind of greyish-violet appearance. It is worthy of remark that the ornamental plumes are more close set, as in *P. minor*; the single barbs show broad intervals, and those at the end of the feathers are without any trace of barbs. Total length 14 inches (360 mm.), wing 7.25 in. (185 mm.), tail 5.5 in. (140 mm.), bill 1.3 in. (33 mm.), tarsus 1.8 in. (45 mm.)."

Reichenow later furnished a figure of his new species and Rothschild included it in his account with a note: "It is suggested that this bird is a hybrid between *P. augustae-victoriae* and *P. guilielmi*."

Some fifteen years later Menegaux described in detail a *P. duivenbodei* (giving a sketch of the head and neck) presented to the Paris Museum by M. Renesse de Duivenbode, killed near Yaour, in Geelvink Bay (M. Seng.). Apparently this was queried by Rothschild as some months later Menegaux published a note: "Mr. Rothschild had examined the skin of *P. duivenbodei* and thought it was *P. maria* Reichenow which he regarded as a hybrid between *P. guilielmi* Cab. and *P. augustae-victoriae* Cab." Of *P. maria* only three

specimens were known, the type in the Berlin Museum, and two in the Rothschild Museum at Tring, the latter pair in the Sattelberg Mountains, one in 1910, the other in 1911. These were loaned to the Paris Museum for direct comparison with Menegaux's type, and Menegaux tabulated a large number of minute differences and concluded that M. Renesse de Duivenbode affirmed that the bird had been killed near Yaour, in the Bay of Geelvink, a long way from the Finisterre Mountains, the home of *P. guilielmi* and *P. augustae-victoriae*.

GOLDIE'S BIRD OF PARADISE

Plate XX, Figs. 1 and 2

This is perhaps the most intriguing of all the true Birds of Paradise, as living on small islands almost in touch with the mainland at the eastern end it has developed excellent differential features. This beautiful bird was discovered by Andrew Goldie, a Scotsman who came out to collect botanical specimens and made large zoological collections inland from Port Moresby, discovering the Goldie River on his explorations. He secured many new birds, but probably this is his most important find. Visiting Fergusson Island, D'Entrecasteaux group, he met with this bird "in the mountains, at a considerable elevation above the sea, the first specimen obtained having been secured at the lowest point. The plumed males and the younger individuals were generally seen three or four together. Once heard, their call was unmistakable, being very like that of *P. raggiana*; but the plumed and wired birds, after giving their call a few times, added to it a peculiar shrill whistle. Their motions whilst calling were identical with those of *P. raggiana*; but, so far as we were able to observe, they had no particular tree for dancing in. The females were found alone. We neither saw nor heard *P. raggiana* on these islands; and the new

bird is not found on the mainland. On showing it to natives of Chad's Bay and China Straits along with a specimen of *P. raggiana*, they in both cases made us to understand that the latter is found in their country, whilst *P. decora* is not; but two or three of them in China Straits who had traded to the D'Entrecasteaux Islands made signs that the new bird was to be found there." Basil Thomson found it on Mt. Maybole in the north and Meek found it not rare, but by no means very numerous on the hills of South Fergusson, from about 1,500 feet upwards.

This bird is so different from any of the others that it is very astonishing to find it on islands so close to the mainland. Although it has been found on more than one island no variation has been reported yet. It is more yellowish above, lavender pink below, with dark red ornamental plumes, but the small inner plumes are black tipped, distinguishing this from all the rest, while the ornamental plumes are seen to be more coarsely separated than those of the true birds. The female also differs in that it shows a throat patch, the rest of the under-surface also showing obsolete barring.

BLOOD'S BIRD OF PARADISE

Plate XIX, Fig. 4

One of the most beautiful of all the problematical forms that have been found in New Guinea is the present species dedicated to the finder, Captain N. B. Blood, whose enthusiasm has opened a new page in the story of Paradise Birds and Bower Birds. Single-handed he has secured more kinds of these birds than most of the huge expensive expeditions have brought back. The quality has been unsurpassed and his material was a great incitement to the preparation of this work. Collected on patrol, they provide a wonderful example of the possibilities of New Guinea and also indicate the futility of imagining all is known about even the Birds of Paradise and Bower Birds in that country.

This bird appears to be so exactly half way between a Blue and a Red-plumed that by the hybrid enthusiasts it may be classed as such, but it was not secured in the area occupied by these two. A comparison is given of the structure for later reference. The bill is shining dark grey, with the culmen curved, the tip small de-curved, nostrils concealed by feathering, under mandible almost as deep as upper; the bill is shorter than those of the Blue or Red-plumed, not as thick as that of the Blue and basally narrower than that of the latter; the interramal space very small, much smaller than in either of the two mentioned. The wing has the first primary narrow with the tip slightly attenuate, while the second is also slightly attenuate at tip, the fourth to the seventh primaries forming the tip, the fifth and sixth subequal and longest; feathers with narrow tips, the secondaries long, ends rounded and broad, but not reaching the same length as the primaries but exceeding second primary in length. The tail feathers broad with rounded tips, square,

central pair very long, webbed for 1 mm. only at each side, stiff. Flank plumes fairly long, longer than in the Blue but much shorter than in the Red-plumed with loose webbing, stiffer than the former and denser, but not soft and flowing as in the latter. The legs are short and stout, strong scutes in front, bilaminate behind, the feet large, the hind toe very long and stout, claws long. As regards coloration the same comparison holds. In front of eye and extending on to the nasal groove and across the forehead the feathers are full, velvety black; below eye and upper throat small crisp iridescent feathers of violet black, a broad band of orange brown separating the glistening throat patch from the breast cushion, which is blackish brown washed with silvery blue, the remainder of the under-surface brown washed with blue. In certain lights the neck band and breast cushion show a strong purplish tone. From the sides of the body spring the flank plumes which are medium in length and with the web stiff and straight out, the upper series fawn red throughout with a bluish tinge, the under series thicker, a little softer, longer, basally crimson, ends brownish blue. The crown and nape feathers are crisp, a little softer than in the Red-plumed, orange brown, the back feathers normal (not velvety as in Blue) bluish brown, as are upper wing coverts; primaries and secondaries deep brown with bluish tinge, upper wing coverts sometimes showing a bronze tint, but no signs of a wing bar; under wing coverts pale brown with reddish tinge. Tail feathers dark brown with blue tinge, long central feathers bluish black with pale blue tips, under tail grey blue. Iris brown, pupil blue black, legs leaden blue. Bill 32 mm., wing 178 mm., tail 130 mm., tarsus 40

mm. Habitat Minyip, Mt. Hagen, Central New Guinea.

This intriguing bird is called *Paradisea bloodi*, and on account of its many struc-

tural and colour characters a new subgenus *Visendavis* was proposed, as this bird must be seen to be admired and understood.

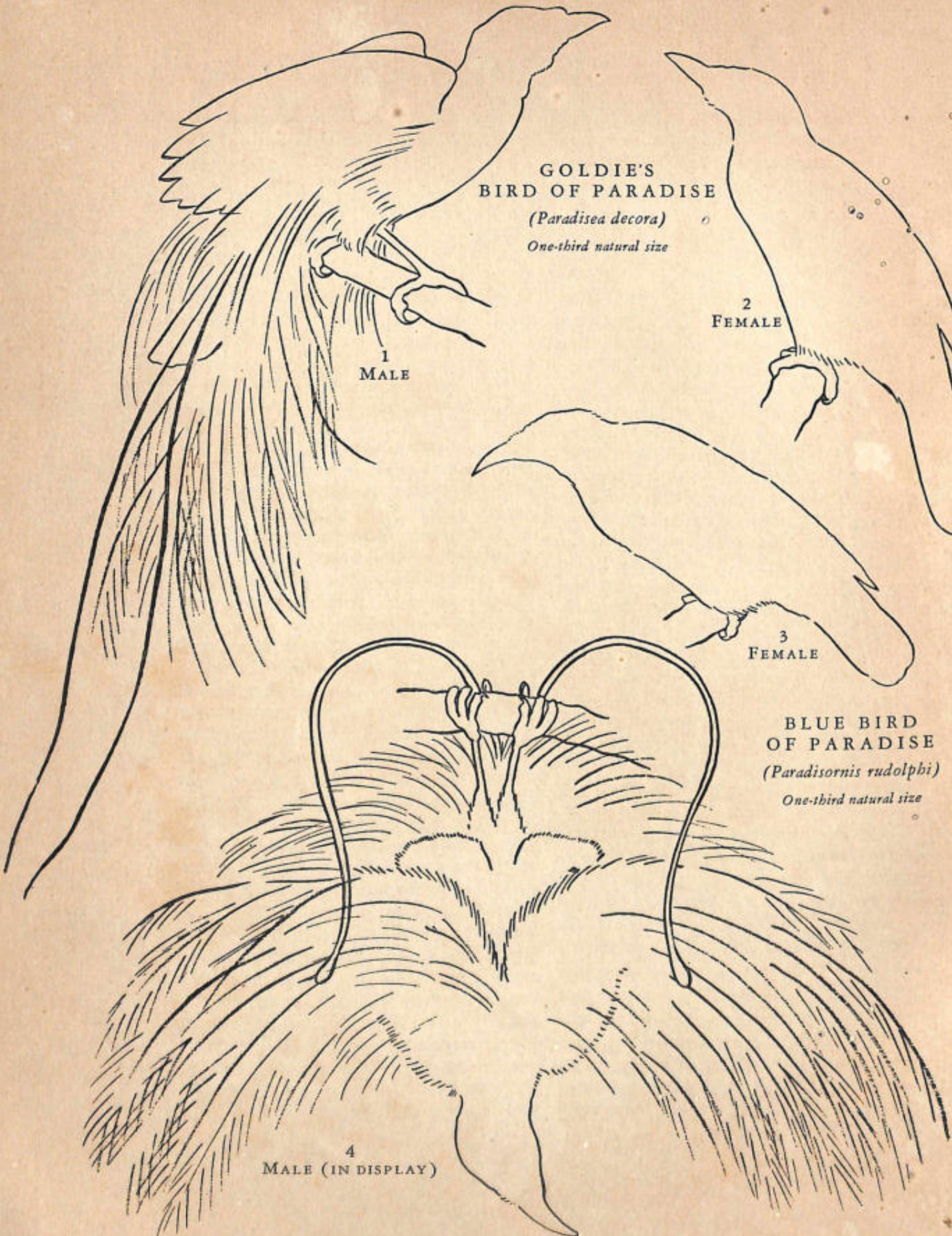
RUY'S' BIRD OF PARADISE

Plate xiv, Fig. 2

Some forty years ago Dr. E. D. Van Oort described a new bird as follows: "Mr. H. H. Ruys, who stayed during four years for commercial purposes at the north-west coast of New Guinea, presented at his return in Holland to our Museum some skins of birds of paradise, among which is, besides the rare *Diphyllodes gulielmi* III, also a species, being as I believe new to science. I cannot place it in any of the described genera of the *Paradiseidae*, it shows some relations to *Diphyllodes* and also to *Paradisea*, but as there are important differences with these two genera, I propose to call it *Neoparadisea ruysi* nov. gen. et nov. spec.

"The bird seems to be a male in not fully developed plumage. The tail is like that of *Paradisea*, composed of twelve feathers, of which the central pair is much elongated, like in *P. apoda* and *minor*, but the barbs are a little longer, those of the outer web are longer than those of the inner web and of a metallic green colour. These two feathers are curved downwards as in *Paradisea*, not aside as in *Diphyllodes*. The shape of the bill is like that of *Diphyllodes*, but it is larger as the bird is larger, and it seems to be of a dark colour in the living bird. The oval nostrils are covered by the somewhat elongated feathers of the forehead, for the rest they are free. The first primary is very short and pointed, the second nearly twice as long; the fourth, which is longest, is 20 mm. longer than the second, the third 3 mm. shorter than the fourth. The webs

of the secondaries are somewhat broadened. Chin and throat are black with a purplish green gloss; foreneck and breast blackish brown with a purplish blue gloss, each feather of the breast fan-shaped at its end and of a brownish colour with a glossy purplish blue margin; belly and under tail coverts blackish brown, the latter with lighter centres. At each side of the body there is a tuft of loose feathers of a sooty brown colour with some whitish brown barbs at the distal end; these flank plumes do not reach the end of the wing. The feathers of the forehead are greenish black; those of the head and neck are short and thick set as in *Paradisea* and they are brownish yellow with small greenish black margins. The feathers of the hind neck and back are elongated, in appearance like those of the back of *P. minor*, but of a bright orange brown colour; the rump and upper tail coverts are olive brown, the tail is dusky brown with some purplish gloss. The wings are also dusky brown, the secondaries having an orange brown margin along the outer web and a sand coloured margin along the inner web. On the upper-surface the wings show, like the tail, a purplish blue shine. The legs are dull bluish black. The measurements are in mm., wing 150 mm., tail 90 mm., two central feathers 360 mm., length of the lower jaw (the upper one is damaged) 32 mm., tarso-metatarsus 42 mm. The bird was collected in August or September 1905 by Papuan hunters near Warsembo on the west coast of the Geelvink Bay,



GOLDIE'S
BIRD OF PARADISE

(*Paradisea decora*)
One-third natural size

1
MALE

2
FEMALE

3
FEMALE

BLUE BIRD
OF PARADISE

(*Paradisornis rudolphi*)
One-third natural size

4
MALE (IN DISPLAY)



Lilian Mealand

opposite the island of Amberpoon, Dutch New Guinea."

From the above Stresemann suggested that the bird was a hybrid between the two birds mentioned by Van Oort, and Mayr has stated the parentage as if it had been proven. The description does not really provide data for such a fantastic

hypothesis and it must be left to future students to determine the truth.

In the meanwhile, for assistance a painting of the type was made by Mr. J. F. Obbes and a reproduction is included in this work. There seems nothing from the illustration to suggest any relationship with *Diphyllodes*.

THE BLUE, THE RED AND THE WHITE
BIRDS OF PARADISE

Plates xx and xxi

Three Birds of Paradise have developed plumes very similar in general appearance to those of the true Birds of Paradise and are generally classed alongside them, some systematists even placing them in the same genus, though they may even be of entirely different origin. This seems almost certain in the case of the Blue; the White is more like the typical, while the Red seems to have developed through isolation from the same ancestry as produced the true Birds. This last one, the Red, was discovered one hundred and fifty years ago, but the other two date back only some sixty years, and they also have a restricted range, the White to the mountain ranges of the Huon Peninsula, the Blue to the south-eastern range of mountains westward to the Mt. Hagen area.

In general, the Red is the most like the normal bird in coloration, but differs in the structure of the plumes and the very long central tail feathers; the Blue has a different bill, different coloration and plumage structure, with again the very long central tail feathers of unlike formation; while the White shows a heavier bill, differing scale feathering of the head, plumes of distinct growth, and again the elongated middle feathers are dissimilar. Details of all these points will be given further on, but a few notes on their discovery follow.

The Red, so named on account of the brilliant red plumes, was introduced by Daudin in 1800 in a general treatise on Ornithology; it was acknowledged that the description was made from a bird in the Paris Museum which had been thus named by Lacepede, but the name had not previously been published. The bird be-

longed to the "Cab. Hollande", which was the collection of the Prince of Orange, that had been looted by the French, and removed to Paris, one of the inevitable "spoils of war" of that age, not returnable. It had been presented to the Prince of Orange by some merchant dealing with the Moluccas, and has since been found to live only on the islands of Waigiou, Batanta and Ghemien. It is remarkable for the curious nature of the streamers of the tail, which has been likened to a thread of seaweed, curled and horny, while the plumes are bright red and curiously curled forwards. In addition the feathers on each side of the forehead appear as blunt horns. The Blue, on account of its extreme contrast with the Reds, Yellows, and Whites, has gained much notoriety since its discovery in the Astrolabe Mountains by Hunstein some sixty years ago. It added to this fame when captive birds began their acrobatic performance of upside down display. The head coloration is black with a white ring of feathers round the eye, but there are no metallic scale-like feathers so notable on the head and throat of the true Paradise-bird; the plumes are blue with some touches of red, and the long tail-streamers are very narrowly webbed on each side. A striking note in the display is the red tips to the short black thigh feathers which, when the bird is reversed, show as a bright red contrasting line. The White, with its very restricted range, was also brought to Europe only about sixty years ago, and while recalling the normal birds in its general coloration, differs in the scaling of the head and its build. The top of the head is covered with closely

appressed scale-like feathers, and the throat has similar long scaly feathers, both vivid emerald green, but not like the

small scaling of the true *Paradisea*. The plumes are also shorter and very much coarser.

THE BLUE BIRD OF PARADISE

Plate xx, Figs. 3 and 4

On account of its entirely different colour pattern from that of the true Birds of Paradise this beautiful bird has become one of the best known, especially recently through its acrobatic display. In captivity it is now well known for its habit of displaying all its beautiful plumage while hanging head downwards from its perch.

It was one of the wonderful finds that rewarded Hunstein when he risked his life venturing into the wilds where fighting cannibals threatened every intruder. The bird fell into the hands of Finsch and Meyer who loyally dedicated the bird to "His Imperial and Royal Highness Rudolph, Crown Prince of Austria, the high and mighty protector of ornithological researches over the whole world." The memory of this Prince will ever remain through the tragedy of Mayerling, which is known throughout the world, while little remains of his ornithological interest save this bird which has even lost its vernacular equivalent in favour of the Blue Bird.

Little has been written about the life history in the field, as its habits are apparently very similar to those of other Paradise-birds, living in the high forests, and performing his comedy-like display of acrobatic tricks to his friends. It is possible that he now displays for the love of it, as in captivity some of the birds will display when they see anyone admiring them. The display probably began as a sexual attraction, but may now have lost that stage as the display of the captive birds is now not restricted to the breeding months only, but whenever they desire.

The genus *Paradisornis* was proposed for this bird when it was discovered, yet some careless workers have referred it back to *Paradisea*, with which it seems to have little close relationship when critically examined. The feathering of the upper parts is of different structure as also that of the under, even the flank plumes differ notably, while the streamers of the tail are webbed on both sides, quite unlike the wires of the true Birds of Paradise.

The bill is much heavier and of a different texture from that of the last-named, straight, culmen arched, compressed but culmen ridge rounded, nasal groove short, feathered, nostrils only appearing as small slits, scarcely visible, the interramal space short, straight, gonys medium; tip of the mandible sharp, small, little decurved. The wing has the first primary short, less than half the length of the third, a little sickle-shaped and slightly attenuate at tip; the fourth to seventh primaries subequal and longest, the secondaries very long and broad with round ends, exceeding the primaries in length, the innermost secondaries (tertials) shorter. The tail is short and square, the feathers broad, the two median very elongated as streamers, very narrow, but webbed on both sides, end in juvenile broader, but not in adult. The legs are medium, stout, scutate in front, rounded behind, feet strong, mid toe longer than outer which exceeds inner, claws long, hind toe stout, claw large, hind toe and claw longer than middle toe and claw. The flank plumes are disintegrated but with the side web more at

RED
BIRD OF PARADISE

(*Uranornis ruber*)

One-third natural size

1
MALE

WHITE-PLUMED
BIRD OF PARADISE

(*Trichoparadisea guilielmi*)

One-half natural size

3
MALE

EXQUISITE
LITTLE KING
(*Rhipidornis guilielmi* III)

One-half natural size

5
MALE

WHITE-PLUMED
BIRD OF PARADISE

(*Trichoparadisea guilielmi*)

One-half natural size

RED
BIRD OF PARADISE

(*Uranornis ruber*)

One-third natural size

2
FEMALE

4
FEMALE



right angles than very acute as in the true Birds of Paradise, and not as long and profuse. In addition there are two sets of small feathery plumes across the lower abdomen. In coloration the only species is as distinct as in structure. The head, neck and upper back velvety black, forming a mantle of long loose feathers, no metallic glitter, but a faint bronze to green sheen may be seen; above and below the eye an arc of white silky feathers shows up strikingly; the wings are blue, brighter on the coverts, but still more vivid on the inner secondaries where both webs are blue, only the outer webs and edges on the outer ones, primaries merely blue edged; lower back black with blue tips, tail feathers blue with shining margins, the two long streamers dark blue with paler blue tips. Underneath the throat blackish, a bluish sheen on the lower breast and the lower abdomen feathers with maroon tips forming a band across the body. The

upper longer series of ornamental plumes are blue at their bases but pass into lilac while the lower shorter series are brighter blue even to their tips. The bill is ivory white, eye brown, feet flesh. Bill 33 mm., wing 157 mm., tail 86 mm., tarsus 45 mm.

The female, unlike the female of the other birds, is not unlike the male, having the same head and mantle with the same sized arcs and blue wings and tail, a little duller throughout but still very similar above, lacking the plumes. Underneath the throat and upper breast are blackish, but the abdomen is dull reddish barred with brown, the flank feathers loose and lengthened, blackish, maybe a little smaller with the tail a little longer. The immature is very like the female. First found in south-eastern New Guinea and apparently very restricted in range, it has now been commonly noted in the Mt. Hagen district and appears to be very stable as to coloration and size.

THE RED BIRD OF PARADISE

Plate XXI, Figs. 1 and 2

It may be as well to point out that sometimes the Red-plumed Bird is called *Raggiana*, at others merely Red, and confusion may ensue. In a popular article in a magazine dealing with the Red-plumed the writer had called it Red and the illustrator had added an excellent picture of the present bird taken either from some standard work or a specimen in a Museum. This Red Bird only lives on the islands to the west of New Guinea, as above noted, while the Red-plumed lives on the mainland from the Fly River eastward to Milne Bay.

The chief features of the present bird have already been mentioned, and on account of its restricted habitat little has been written about it, so that Wallace's account, written in his popular racy style, is still quotable: "When I first arrived I

was surprised at being told that there were no Paradise-birds at Muka, although there were plenty at Bessir, a place where the natives caught them and prepared the skins. I assured the people I had heard the cry of these birds close to the village; but they would not believe that I could know their cry. However, the very first time I went into the forest I not only heard but saw them, and was convinced there were plenty about; but they were very shy, and it was some time before we got any. My hunter first shot a female; and I one day got very close to a fine male. He was, as I expected, the rare red species, *Paradisea rubra*, which alone inhabits this island and is found nowhere else. He was quite low down, running along a bough searching for insects, almost like a Woodpecker; and the long

black riband-like filaments in his tail hung down in the most graceful double curve imaginable. I covered him with my gun, and was going to use the barrel, which had a very small charge of powder and No. 8 shot, so as not to injure his plumage, but the gun missed fire, and he was off in an instant among the thickest jungle. Another day we saw no less than eight fine males at different times, and fired four times at them, but though other birds at the same distance almost always dropped, these all got away, and I began to think we were never to get this magnificent species. At length the fruit ripened on the fig tree close to my house, and many birds came to feed on it; and one morning, as I was taking my coffee, a male Paradise-bird was seen to settle on its top. I seized my gun, ran under the tree, and, gazing up, could see it flying across from branch to branch, seizing a fruit here and another there; and then, before I could get a sufficient aim to shoot at such a height (for it was one of the loftiest trees of the tropics), it was away into the forest. They now visited the tree every morning, but they stayed so short a time, their motions were so rapid, and it was so difficult to see them, owing to the lower trees which impeded the view, that it was only after several days' watching, and one or two misses, that I brought down my bird—a male in the most magnificent plumage. I had only shot two *Paradiseas* on my tree when they ceased visiting it, either owing to the fruit becoming scarce or that they were wise enough to know there was danger. We continued to hear and see them in the forest, but after a month had not succeeded in shooting any more; and as my chief object in visiting Waigiou was to get these birds, I determined to go to Bessir, where there are a number of Papuans who catch and preserve them. There I met the men who were accustomed to catch the Birds of Paradise. At intervals

of a few days or a week some of them would return, bringing me one or more birds. As they caught them a long way off in the forest, they would scarcely ever come with one but would keep it in their house till they caught another." This bird is not unlike the true Bird of Paradise until examined critically, and the genus *Uranornis* is merited, as in addition to the structure of the tail streamers and ornamental plumes, the frontal tufts are peculiar. The bill is small, not unlike that of *Paradisea*, the culmen arched, but the tip small, the nostrils hidden, interramal space feathered, chin tuft present. The wing has the fifth primary longest, the fourth a little shorter equal to the sixth, the seventh a little longer than the third which is about twice the length of the small first; the primaries pointed, the secondaries long and broad and mounted at tips, reaching shortest ninth primary, and nearly equaling third; tail short, square, feathers broad, two long streamers developed in a twisted manner in and out like narrow ribbons of seaweed; they begin as long narrow spatulate tipped feathers, and apparently develop each moult. The ornamental plumes are also of peculiar formation, as they have rather stiff shafts making an inward curve and bearing rather straight webs; legs short, stout, scutellate in front, bilaminate behind, feet strong. Bill 28 mm., wing 175 mm., tail 130 mm., tarsus 48 mm. The coloration of the only species is also striking, as the front of the head has two horns and these are covered with bright green scaly feathers which agree with those of the forehead and throat, while the large chin patch is velvety black; the top of the head and back and large wing covert patch are bright yellow, which also forms a broad throat band spreading downwards at the edges like a breast shield; lower back brown with reddish tips, rump yellow;

wings and tail red brown; lower breast dark maroon, paler posteriorly, flank plumes scarlet, deep crimson inwardly, towards the tips purplish, the tips themselves white; tail streamers silky brown. The female lacking the frontal horns has the top of the head and throat brownish black, feathers short and crisp, back of head yellow, back with dull yellowish tips,

rump and upper tail coverts red brown; wings red brown, bend of wing tinged with dull yellowish, tail long red brown, two mid-tail feathers shorter and narrower than the others; breast yellow, sides longer, forming an arc, rest of under-surface maroon, uniform, not paling posteriorly. Measurements a little smaller than those of male.

THE WHITE-PLUMED BIRD OF PARADISE

Plate XXI, Figs. 3 and 4

The original description of this beautiful novelty was somewhat brief: "The whole crown and the sides of the head and neck as well as the throat from the chin to the breast shining green, the nape, back and smaller wing coverts pale yellow; the flank plumes white, towards the basal part yellow, the single plumes loose with very long radii, the wings, rump and tail dull chestnut; the breast and sides of the abdomen chocolate, the centre of the abdomen, under tail coverts and thighs almost black." The name given was *Paradisea guilielmi* in honour of the Kaiser Wilhelm, the author being a German and the bird found by Germans in German New Guinea, then called Kaiser-Wilhelm's Land. It is better known as the White-plumed and is restricted to the Mountain Ranges of the Huon Peninsula and is quite abnormal when contrasted with the true Birds of Paradise living thereabouts. Again there is little life history. Rollo Beck wrote: "How closely birds keep to certain heights was illustrated by the vociferous calls of this bird. This species begins to make itself heard plentifully at about twenty-two hundred feet, where it replaces a related species that inhabits the forest in the lower zone. From twenty-two it is heard regularly up to four thousand,

where it abruptly stops. We spent some time at Zagaheme, which is four thousand feet, and though we heard and saw the birds often about the village and below it, when I climbed up a few hundred feet on the ridge behind the settlement, the bird was missing, even though I could hear it calling a thousand feet below my trail."

This is a curious development in the plumed series, as while it looks not unlike a true plumed bird, its long bill and thick neck differ so notably that the immature puzzle at first and are dissimilar from the immatures of any other, approaching a little the male adult. The long narrow bill of the true bird type, the white plumes, dark under-surface, peculiar feathering of the head and throat, resolve the separation of this species generically as *Trichoparadisea*. The wing is structurally similar to that of the preceding, to which it is certainly not closely related, while the tail is square as usual, with the two central feathers developed into long wires. The whole top of the large flattened head to behind the eyes and the whole throat and upper breast are covered with shining small emerald feathers closely packed, but not like the emerald feathers of the front of the true *Paradisea*; the remainder of the under-surface is purple maroon, lower

abdomen in the middle whitish; back of head and mantle composed of long disintegrating yellow feathers with dark bases, the back brown, upper tail coverts, tail and wings deep red brown, bend of wing bright yellow, flank plumes pure white, lower bases yellowish, webs disintegrating at right angles rather stiff, never soft and flowing. The tail wire streamers very long and thin. Bill 35 mm., wing 170 mm., tail 120 mm., streamers over 600 mm., tarsus 45 mm. The female has the top of head, face and throat (same

limits as green in male) deep maroon, nape yellowish white, back red brown washed with yellowish white, lower back, rump, upper tail coverts uniform dark red brown (or chocolate) as wings and tail; remainder of under parts paler maroon washed with white, thighs and under tail coverts uniform maroon, tail square, two central feathers narrow and a little shorter than the others. Measurements a little smaller than the male. Immature as female showing limits of adult throat patch and cap.

MANUCODES

Subfamily *Manucodiinae*

Plates XXII and XXIII

ONE of the most curious of word-transferences in the whole of Natural History is the usage of the word Manucode for a series of black unadorned birds probably with little relationship to any other of the whole medley associated as Birds of Paradise, to which the words *Manu-co-dewata* were applied. *Manucodiata*, as a Latinisation, was commonly used by the earlier writers, probably more often than *Paradisea*. Linne used *Paradisea* in preference, but the better ornithologist Brisson used *Manucodiata*, and the slightly earlier name usage by Linne fixed *Paradisea*, and Brisson's choice went into the discard. A little later, probably accidentally, Boddaert introduced *Manucodia*, the final "ta" probably dropped in the press, and as it happened to have only the dark bird with it, the name has come into use. But the French still call the little King-bird "Le Manucode", so care must be taken.

Four Manucodes are supposed to live in New Guinea, while on islands to the west outside the New Guinea limits some birds called Paradise Crows are sometimes included (incorrectly) among the Birds of Paradise.

Thus as already noted Manucodes have been cited as being nearest the parent stock of the Birds of Paradise, and being very crow-like, both of which statements are obviously inaccurate. In the first place they are very unlike the hypothetical ancestor of any Bird of Paradise, and in the second they are very unlike crows save for the dark plumage. The bill is a striking feature in the Crows, and is very different in structure from that of these birds, which is that of the Australasian Shrike

series and shows relationship with those birds distantly.

If *Lycocorax* can be regarded as a derivative of the ancestral Southern Crow Shrike (the word Crow meaning here large or dark, and not Crow-like), from which also sprang the series *Cracticus*, *Gymnorhina*, *Strepera*, it would structurally be nearer the basal prototype but would be advanced in coloration. Pursuing this line of thought, the Manucodes might have developed from a branch a little lower than the *Lycocorax*, and the Glossy-mantled Manucode, as above indicated, would be the next movement clearly seen in colour-advance and perhaps a little in structure. Before continuing to the Green Manucode, an offshoot might have produced the Trumpet Bird which has spread further than the Manucode branch, whose progress may have been arrested in continuing the feather curling process and reaching the outlying islands. Isolated and freed from opposition by either the Glossy-mantled or the Trumpeter the evolution of the curling continued with increase of size and lack of mobility suggesting the extinction of that form at some later period, while the progress of the Trumpeter Bird suggests its longest survival. To reiterate, there does not seem any relationship whatsoever with any existing Bird of Paradise from whatever angle, structure or coloration, and though the Manucodes, as a whole, are included in the medley of Birds of Paradise they should be split off as a sub-family to indicate their definite distinction.

Lesson regarded these birds as related to the "Australian Butcher Bird" series and this seems confirmed by Beddard.

"Among genera nearly (?) related to the *Corvidae* are various slight modifications of skull structure. In *Manucodia*, for instance, the rostrum is broadly ossified and fused with the co-ossified palatal plates of the maxillae. The nasal septum is complete, and the conjoined ectethmoids and lacrymals are enormously swollen. The palatal conditions of *Manucodia* are repeated and emphasized in *Gymnorhina* and *Strepera* . . . In *Cracticus cassicus* there is the same state of affairs."

Attention must be drawn to a feature which has been figured in many places.

Early examination by Lesson indicated the peculiar structure of the trachea which is very elongated and peculiarly convoluted in the male. Further, this convolution is not uniform even in the same area, so that different illustrations are on record. The use or necessity of this development is not understood as in the apparently related genus *Manucodia* it has not yet been observed, the trachea being simple in the specimens examined.

An interesting suggestion was that this convolution assisted in producing the "trumpet" note.

THE PARADISE CROW

Plate xiv, Fig. 5

These extra-limital birds may be related to the ancestors of the *Manucodes*, and are here included merely on traditional usage, and to show how little they merit the honour of being classed with Birds of Paradise. They appear to be more like Crow Shrikes, the group which puzzled Kitchen Parker so much in his anatomical studies, that he classed a series of southern birds as *Noto-Coraces*, and it seems certain that these would easily fall into that series.

The Paradise Crows do not even enter New Guinea, being restricted to the Halmahera Group, the wrong side of the Gilolo Passage which separates the purely Moluccan islands from the New Guinea satellites.

The first bird was introduced as a *Corvus pyrrhopterus*, that is a red-winged Crow, the bird being dark coloured, blackish green with dull brownish red wing feathers. This bird lived on Halmahera and was almost immediately separated under the generic name *Lycocorax*, but was later classed under *Manucodia*, but nowadays *Lycocorax* is recognised. Then Schlegel noted: "Amongst the skins of birds collected by Dr. Bernstein in the

island of Mortay (Morotai today) there is a new species of *Lycocorax* (*L. morotensis* Bernstein) resembling the *L. pyrrhopterus*, but somewhat larger, and having the primaries from the 2nd to the 7th white for the first third of their length." A third species was named by Bernstein from the Obi Islands with scarcely any white on the primaries. The genus has also been collected on Batjan by Bernstein, but the form has not been separated, being regarded as referable to the typical *pyrrhopterus*. Hartert noted of the Batjan series: "There is no difference between the males and females, though some of the birds sexed female are smaller than those marked male. The iris in the male was marked deep crimson, in the female dull crimson." The only field notes seem to be those by Bernstein from Morotai, who wrote: "Like the other species of the genus, it inhabits the thick woods and is rarely seen outside of them. It generally lives in trees of moderate height, especially where they stand close together, in the tops of which it hides closely, so that, though often heard, it is a very difficult bird to see. It is most easily observed, if the hunter places himself in the early

morning near some tree on the fruit of which the bird comes to feed. But even then the greatest attention must be maintained, as the bird does not come flying in like a Pigeon, but glides quietly from the top of one tree to the summit of another, lights for an instant on some fruit-bearing bough, is seen for a second on the outer branches, and then dives into the thickest of the foliage. It all its ways of life there is very little Crow-like, and it seems to feed exclusively on the fruit of trees. Its cry is a short, interrupted, monotonous 'wuhk' or 'wunk,' which is especially heard in the morning and evening. My hunters fancied that the note had some similarity to the ringing bark of a dog, and called the bird 'Burung andjing' or 'Dog-bird.' "

As regards the structure of this genus *Lycocorax*, it recalls *Cracticus* more than *Paradisea*, and the bill is long, stout, compressed laterally, deep, culmen a little rounded and broadened basally, straight, culmen slightly arched, tip decurved, posteriorly notched, interramal space large, half the length of the mandible, broad triangular, feathered, feathers with bristle tips; there is no nasal groove, the nostrils placed near base, open, oval with

septum inside; the feathers around the eye are directed upwards and forwards with bristle tips as have the feathers at the base of the lower mandible, like those of the chin. The wing is long and pointed, the feathers narrow and pointed, the secondaries not very broad and rounded; the wing tip is formed of the fourth to seventh primaries, the fifth and sixth subequal and longest, the third equal to the eighth, the second equalling the secondaries, the first primary about half the longest one. The tail is long and slightly boat shaped, feathers rather narrow, forming a rounded tip, coverts, both upper and under short. The legs rather short and very stout, the front smooth, the back bilaminate, the feet strong, claws large, outer a little longer than inner and a little shorter than middle toe; hind toe long and stout, claw large and strong, hind toe and claw equalling middle toe and claw. The coloration is very ordinary, as is the feathering, a dull greenish black with faint sheen in certain lights owing to the looseness of the webbing; the tail is more blackish while the primaries are dull rusty, the secondaries browner. Bill to base 40 mm., wing 190 mm., tail 150 mm., tarsus 40 mm. The sexes are said to be alike.

THE GREEN MANUCODE

Plate xxii, Figs. 2 and 4

It has been boldly stated that this form is the ancestral type of all the so-called Birds of Paradise, and however different some may look the links are available and easily recognisable. It is possible that no more misleading and inaccurate statement has ever been made in connection with bird study wherein many unconvincing suggestions have been proposed. The little group of which this was the first member to reach Europe has a facies quite unlike that of any Bird of Paradise. In fact its

only claim is that it occurs in New Guinea and has glossy plumage, which facts are shared by the Grackles and Shining Starlings. It has already been noted that the Manucodes may be related to the Australian Crow Shrikes, but even that relationship must be fairly distant.

It is a somewhat sombre bird to have achieved the rank of Paradiseism, and this status dates back to the earliest days when every glittering and showy bird from the Far East was so classed. While other

GLOSSY-MANTLED MANUCODE

(*Manucodia atra*)

Two-fifths natural size

1
MALE

GREEN MANUCODE

(*Manucodia chalybat jobiensis*)

Two-fifths natural size

2
MALE

CURL-CRESTED MANUCODE

(*Eucorax comrii*)

Two-fifths natural size

3
MALE

GREEN MANUCODE

(*Manucodia chalybata*)

Two-fifths natural size

4
MALE



Lilian Medland

birds thus included have been discarded, this form has retained its place through its locality prejudice. Nothing much seems to have been written of its habits as most of the expeditions into North-West New Guinea were collecting ones, not interested in bird observation.

Claude Grant wrote: "This Manucode was only observed in the mountains, but it has the same habits and appearance as the other species," and of the other species, "This was the commonest of the Manucodes around Parimau, where it might be seen everywhere throughout the jungle. A long-drawn moaning note was attributed to this species, both by myself and by the two Dyak collectors. A nest with two eggs was obtained on the 28th of December, suspended between two horizontal branches about eight feet from the ground."

The genus *Manucodia* includes dark coloured birds with various colour reflections, and some of the head and neck feathers crisped, while the tail is more or less boat-shaped. The bill is long, deep, compressed laterally, tip hooked and posteriorly notched, the nasal groove long and shallow, feathering approaching but not reaching the nostrils, which are narrow oblique ovals exposed, interramal space large, feathered, gonys short. The wing is rounded, the fourth to seventh primaries subequal and longest, the third little shorter and equalling the eighth, the second shorter than the ninth and the secondaries which reach the ninth in length and are broad and rounder. The tail is very long, boat-shaped, rounded at the end. The legs strong, front scutellate, back bilaminate, toes strong, claws sharp, hind toe long, claw strong. The typical bird has the head and neck all round green, feathers short and crisped, under-surface with a blue-violet sheen, upper violet, the basis of the feathering being black and in a dull light the bird appears black with no colour

sheen. The other bird figured has the head deep purple, the throat purple, a breast band showing a slight green sheen, the under-surface deep purple and the back very deep purple, the wings and tail purple, the feathers of head and breast crinkled. This specimen came from the Huon Peninsula.

There is a lot of trouble in connection with the older form, the Green Manucode, which was illustrated in the *Planches Enluminees*, while an excellent description and figure were given by Sonnerat, who called it the Green Bird of Paradise, being apparently the first to so class it. It apparently came from north-western New Guinea and Arfak Mt. has been selected as the most likely habitat. There was no suggestion of forms for about a century as it was a very rare bird, and the exploration of north-western New Guinea only began about that time. Then Salvadori named an island form *Manucodia jobiensis* as having a green head, green below, with the wings and tail violet. Some ten years later Meyer described another species from the east coast of Geelvink Bay, *rubiensis*, as smaller than the Arfak one. These were all from the vicinity of north-west New Guinea, but the form was known to occur in south-eastern New Guinea, and Finsch and Meyer had recorded that examples agreed well with those from the other extremity "except that in the former the neck feathers seem to be more brilliantly coloured, and are altogether rather more bluish." Salvadori then named the eastern form *orientalis*, pointing out the bill was more slender and that the feathers of the neck (as noted by Finsch and Meyer) were more bluish, and also the feathers above the eye were longer and more pronounced. Rothschild and Hartert noted that it was (to them) much smaller with a smaller beak.

It appears unquestionable that Salvadori and Meyer were separating forms

which were binomially named but which today are regarded as subspecies or geographical races. As such there would not have been much cause for disagreement, but someone introduced the idea of twin species. In some parts of the world two very closely related forms are found inhabiting the same restricted locality and differing so slightly that great care and judgment must be exercised in determining the specimens; these have been called "twin species" to signify the apparent relationship.

Someone invented the idea of there being twin species of Green Manucodes, and this has become an obsession although every worker has tried to produce data to support the ghostly figure of the twin. Many birds have been examined and the variation suggests triplets or quintuplets but never any recognisable twin. A rather detailed account was given by Stresemann, who measured a number from the same general locality, and concluded the second species for which the name *jobiensis* was used, was a larger bird with a different shaped bill and a shorter tail, the latter being given in percentage of wing length, an amusing method. For his solution read something like this:

chalybata—bill 41-42, wing 168-169, tail 138-142, Index tail to wing 76.4-84.5

jobiensis—wing 180-190, tail 130-144, Index tail to wing 69-77.4

but the type of *jobiensis* had a wing length of 190 with tail 155 with index 81 and the smaller *rubiensis* placed with it had wing 160 with tail 125 also index 80. Therefore according to the Index rule both the type of *jobiensis* and the type of *rubiensis* belonged to the species *chalybata*.

The same conclusion applies to coloration, as Salvadori's *jobiensis* was green above and below with the wings and tail violet tinged, the only difference from *chalybata* being that the latter had a bluish

back. It had also been suggested that the two species were separated altitudinally and that *jobiensis* was restricted to the lowlands (where it occurred) while *chalybata* occupied the higher altitudes. This is, however, more than doubtful, as the latter is commonly reported from the low levels even by workers who attempt to separate the twins. In any case there would be only subspecific distinction on the data provided and in the case of *chalybata* no subspecies has been allowed in the most recent list; this is too extreme, as there are certainly geographic races separable in the island of New Guinea, but these have not yet been correctly diagnosed.

As instancing the confusion it may be recalled that Salvadori said that his *jobiensis* was green above and below, while Meyer's *rubiensis* was smaller than *chalybata* without any colour distinction. Ogilvie-Grant, discussing birds from the southwest nearer *rubiensis* locality than either that of *chalybata* or *jobiensis*, plumped for the twin species theory, thus: "Though in general appearance much like the other curly-headed species associating with it, *M. jobiensis* may be distinguished from its nearest ally, *M. chalybata*, by having the short curly feathers on the chest and breast dark steel-blue, instead of glittering golden-green; and the feathers of the mantle violet with a very narrow submarginal line instead of velvet black changing to purple, edged on either side with steel-blue. When turned away from the light the mantle in *M. chalybata* appears to be dead velvety-black. As I pointed out in my preliminary notes *M. chalybata* (named *M. orientalis*, which is a synonym) and *M. jobiensis* are distinct species inhabiting the same localities." If the preliminary notes referred to be read the confusion becomes intensified. "These curly-headed species are much alike in general appearance, but *M. orientalis* has the short

curly feathers on the chest and breast glittering golden-green, while in *M. jobiensis* and *M. altera* the same parts are dark steel-blue. Inter se, the two latter kinds differ considerably, both structurally and in colour. *M. jobiensis* is smaller and has the feathers of the throat round and crinkled, and the upper parts glossed with a strong shade of violet."

No measurements were adduced, and the type of *jobiensis* had a very long wing, making it a large bird, but it may be noted that Claude Grant, who collected some of the specimens discussed by Ogilvie-Grant, stated that *M. chalybata* "was only observed in the mountains, but it has the same habits and appearance as the other species," while of *M. atra* "I was unable to distinguish this Manucode in its natural habitat from the two allied species."

From the records it would seem that there is only one variable species showing some altitudinal variation, and that many subspecies will later be recognised, say from Mysol, Arfak Mts., Japen, south of Geelvink Bay, Mimika and Satekwa River area, Fly River, South-East New Guinea, Sattelberg, Sepik Mts., and north coast. This is confirmed by the conflicting reports, first, from Mysol, birds were collected which caused one worker to deny the separability of *atra* and *chalybata*, a fact now well established; second, the Arfak Mountains are the habitat of the typical *chalybata*; third, that *jobiensis* belongs to Japen is certain; fourth, the small

rubiensis may be confirmed; fifth, the birds described by Ogilvie-Grant appear very distinct from coloration alone; sixth, the Fly River birds cannot be placed under the typical subspecies; seventh, the south-eastern form has been named *orientalis*; eighth, Sattelberg birds need reconsideration; ninth, the Sepik birds also should be re-examined, and with the elimination of the *jobiensis* myth facts might indicate how much difference there really is; and tenth, the north coast birds would also repay investigation scientifically carried out.

As an indication, study of the plumage changes should be undertaken, as when Van Oort recorded *M. c. orientalis* (a curious determination) from the Noord River district he concluded: "These examples belong to the eastern smaller form, which has a much smaller bill. Both birds are immature, the feathers of the throat and foreneck are not yet crinkled (yet the measurements are given as:—male: wing 175 mm., tail 155 mm.; female: wing 162 mm., tail 135 mm.). They are distinguishable from *M. ater* (Lesson) only by the purplish gloss of back, wings and tail, and by the more bluish gloss of the head, which is green in *ater*." Rand recorded *M. jobiensis* and *M. chalybata* from the Bernhard Camp area, but gave no differences, yet recorded the measurements of the wings only of the same limits, and referred to *rubiensis* suggesting similarity in size.

THE GLOSSY-MANTLED MANUCODE

Plate XXII, Fig. 1

When Lesson met with these birds alive in New Guinea, he proposed a new genus *Phonygamus*, sharing the authorship with his colleague on the voyage, Garnot, on account of the ears of the smaller form. They included, however, the old described green bird and added a third *ater* mean-

ing black, but diagnosing it as resembling the green bird and the same size. The plumage is "*vert sombre, à nuances de fer spéculaire, mais terres et sans éclat doré ou cuivre.*" This does not read like the bird now called *ater*, but apparently the nomination of reflections is beyond all

writers, as Sharpe in his Monograph stated that "the crinkled feathers of the throat and foreneck were steel black with an edging of velvety black, not oily green," and then in his description wrote: "Head all round steel green without any purple reflections, the neck all round greenish like the head."

The Glossy-mantled, as here used, is a larger bird in every dimension, and has the throat feathers long, shining, not crisped, the head feathers short but not much crisped. The coloration varies considerably in detail as noted hereafter. When the birds collected by the British Ornithologists' Union were examined in the Museum, three species were separated and field notes were given, and of this bird Claude Grant wrote: "I was unable to distinguish this Manucode in its natural habit from the two allied species." It seems probable that a re-investigation of the specimens recorded would alter the determinations of the specimens, as there is discordancy in the matter, apparently colour reflections being used to separate the species. The females do not show the same colour reflections as the males according to some workers. The colour of the eye in the Green bird is there recorded as greenish-golden, while in the present species it is stated to be orange or orange red, an item worth looking to.

Rand has given an account of the breeding habits: "At Lake Daviumbu in August and September this was a common forest species feeding in fruiting trees and spending most of its time in the lower parts of the forest canopy, and the tops of the lower trees. It was frequently found in pairs and was not especially wary. When nervous, these birds give a quick little flit to their tail and have a deep 'chug' call repeated a number of times, apparently expressing alarm or annoyance. A call commonly heard at this camp, and which I think was given by this bird was a

drawn out, whistled call, and is probably similar to the 'long drawn moaning cry' recorded for *M. jobiensis* by Claude Grant. In addition I have heard a low chattering call given at the nest. In flight these birds have the heavy, silken, rustling of wings common to many Birds of Paradise. I was watching a bird feeding in a seventy-foot fruiting tree in the forest. Another came into the tree, and was at once chased some distance, both birds disappearing from sight through the forest. Trying to locate the birds again I saw one, apparently adult, sitting in the top of a tree, twenty yards from the fruiting tree. It sat there quietly some time preening its feathers. Then another came flying through the forest to perch there below it. The first bird began to shake its slightly spread wings and tail and hopped down near the new arrival. The second bird flew to another branch ten feet away, followed by the first bird. The latter again shook its wings and tail and erected its body feathers for a moment. Then both flew off through the forest. Possibly this is part of the display of this species. Two nests were found in thirty to thirty-five foot trees, the nests being twenty to twenty-five feet up. Two eggs are laid, and the incubation period in one nest was found to be between fourteen and eighteen days. From watching I conclude that this bird may be monogamous and that the male assists in the brooding and probably in feeding the young. Previously it was wrongly concluded that the males did not approach the nest during incubation nor assist in it."

As to the species and forms of Manucodes, there is not any unanimity of conclusion, as, though similar names appear in papers, they are differentiated incorrectly, and do not mean the same thing.

Firstly let us discuss the Glossy-mantled Manucode, *Manucodia atra*. This was first distinguished by Lesson in 1830, half a

century after the Green Manucode had received a scientific name, *chalybata*. Owing to the difficulty of judging the colour reflections no forms of this were indicated for nearly seventy-five years, although the distribution of the species extended from the western islands to the far eastern ones. Then a name was given to the form inhabiting these islands, the same name for the two extremes, but twenty odd years later this error was rectified by the same worker. That is how the matter stands today, one form on the Aru Islands, another ranging unchanged throughout the whole of New Guinea, and then another form from the Louisiades. To be exact, the arguments by Rothschild and Hartert are here reproduced: "*Manucodia ater altera subsp. nov.* Specimens from the south-eastern parts of New Guinea, namely British New Guinea and the Louisiade Islands (Sudest) are so much larger, wing in males 193-206 mm., bill about 40-44 mm., against wing (male) 168-188 mm., bill 35-40 mm. in typical *ater*, that we are obliged to separate them under a new subspecific name. The bill is altogether stronger (less slender) and higher, and generally longer tail and wings longer. In adult birds the head is generally less greenish than in typical *ater*. The Aru specimens are, as far as we can see, perfectly similar to those from Sudest Island and British New Guinea, while those we have been able to examine from German New Guinea belong decidedly to the smaller form. This is extraordinary

and not at all what we would have expected. In *Manucodia chalybata*, for example, we find that the specimens from German New Guinea go better with the race inhabiting British New Guinea (which in this case is the smaller one), and in the genus *Phonygammus* we find the form occupying the Aru Islands to be the same as that from Dutch New Guinea, while in British New Guinea occurs a rather different one. Young birds of both races of *M. ater* are duller and much more greenish. Type from Sudest Island, A. S. Meek." The data above given were later adjusted by the same authors in the case of the Aru Island form only, separating it as *Manucodia atra subalter*.

The variation on the mainland must be treated as in the last species and many subspecies or "clines" may be indicated. The latter word "cline" is a very bad name for a sub-subspecies, and should be eliminated at once. Thus while Rand states the female is smaller and recognisable in the field at Lake Daviumbu (though his measurements do not show any great discrepancy in size of the sexes), Berlepsch also measured the males and females of the Aru Island form as being the same size in wing and tail. Stresemann found little size difference in measuring Sepik birds, while a Konstantin Hafen bird had a longer wing still. From Collingwood Bay a very large bird had a wing of 190 mm. with a tail of over 203 mm. If these data were utilised in connection with coloration some valid results might be achieved.

THE TRUMPET BIRD

Plate XXIII, Figs. 3 and 4

The smaller eared Manucodes are all classed together as belonging to one species, but this view may prove incorrect, as everybody has been puzzled in allotting geographical areas to the so-called sub-

species. The arguments would occupy a lot of space and get us nowhere as the methods of determination must be reviewed. A series of young to old, male and female, from one locality, say near

Port Moresby, where this bird was reported as common, and seasonal variation as well as age-growth examined, would provide the clue. Thus in this area two very different-looking birds have been reported, and no two authorities have agreed upon the reason for the differences, which are rather easily seen. They were separated by colour and a little by structure, but the latter in this group is almost as variable as the former. The bird is similar to the preceding in general appearance, but is more slender and is characterised by the presence of two ear tufts of elongated feathers. Similar sheen in coloration is seen, but no crisping of head feathers, the ear tufts may be larger or smaller and the coloration may vary from green to purple in various combinations; whether it does this in the same individual is one of the items necessary to be determined, as sometimes the purple one is regarded as the young and vice versa. The most recent complication has arisen in connection with the Australian form which has been acknowledged as distinct for nearly ninety years on account of its very green plumage. In the Cape York district a purple bird turned up and this was separated but immediately rejected as of no interest, while the Queensland bird was still maintained as very distinct on account of the constant greenness. Such decisions are certainly not helpful. North suggested that the vernacular name of Trumpet-bird, from its peculiar note, might be adopted to differentiate it from the Manucodes. Thorpe observed: "I found Gould's Manucode fairly plentiful in the dense brushes close to Somerset. Usually they are met with in pairs, high up in the fruit and berry-bearing trees, and frequently in company with other species. The males utter a very loud and deep guttural note, unlike that of any other bird I am acquainted with, and it astonished me that a comparatively small bird could make so much noise. In

the trees they are very active in their movements, and on the appearance of an intruder evince more curiosity than timidity. I have frequently shot them by trying to imitate their notes, or by making a strange noise, when they would hop down from branch to branch in an inquisitive kind of way, as if trying to ascertain its source. The bird is particularly fond of the fruit of a certain species of fig; but the stomachs of those I examined contained insects, as well as fruits and berries of various kinds."

Banfield wrote from Dunk Island, North Queensland: "To the manucode is ascribed practical interference with the laws of Nature. This handsome bird, of jet black glossy plumage, comes hither in September, adding to the pleasant sounds of the jungle a loud rich note, which closely resembles the frequent repetition of the name bestowed upon it by the blacks, 'Calloo-calloo.' As are its visits so are its notes casual, coming in erratic bursts and sudden sallies of whirling spiral sound. Its advent is hailed with satisfaction, for the belief exists that it causes the beantree—the source of a much esteemed food—to grow more quickly. This faith has a substantial origin, for shortly after the bird's first fluty notes are heard the beantree blossoms, renewing the promise of plenty. While here, the 'Calloo-calloo' is remarkably shy, very rarely venturing out of the seclusion of the thickest jungle, and warning off intruders with a curious note of alarm, half purr, half hiss."

Rand wrote: "This was a fairly common species at Rarara, Wassi Kusse River, where it was usually found in substage trees and tree tops in the rain forest. It was usually seen singly or in pairs and came to fruiting trees to feed. Its call, commonly heard, was a loud harsh squawk, somewhat recalling the call of *Mino dumontii*. On December 12 I heard

one of these birds, and saw one, then another, fly to a large, horizontal exposed branch thirty feet up. They were male and female, judging by their difference in size. They perched a foot or so apart, the male turned toward the female and depressed the fore part of its body so that it was more or less parallel to the branch on which they sat. The male then slightly raised and spread its wings, erected its body feathers and gave a single loud, slightly prolonged harsh call, relaxing its feathers and folding its wings as it did so. Then the male moved toward the female which flew fifty yards into the forest where the performance was repeated. Apparently the chasing and display continued for some moments, though, due to the density of the foliage and frequent movements of the birds, I could catch only an occasional glimpse of them. Apparently this display was given solely for the benefit of the female. The above is evidently the mating display of this species, and, from this and the fact that the species is frequently, perhaps usually, found in pairs, one may perhaps conclude that this bird is monogamous and that both male and female take part in the nest duties, as in *Manucodia*. This conclusion is in accord with the observations on the Queensland race."

When Lesson and Garnot discovered this new form of Manucode at Dorey, north-west New Guinea, they did not hesitate to introduce a new generic name while affixing as the trivial name that of their friend, Keraudren. It was found to extend across New Guinea and even to reach into northern Queensland, where it was procured by Macgillivray at Cape York. G. R. Gray, reporting upon a collection of birds sent by Mr. Wallace from New Guinea, wrote: "The specimen figured by Mr. Gould, in his *Birds of Australia*, as from Cape York, is of a uniform glossy golden green, with the feathers of

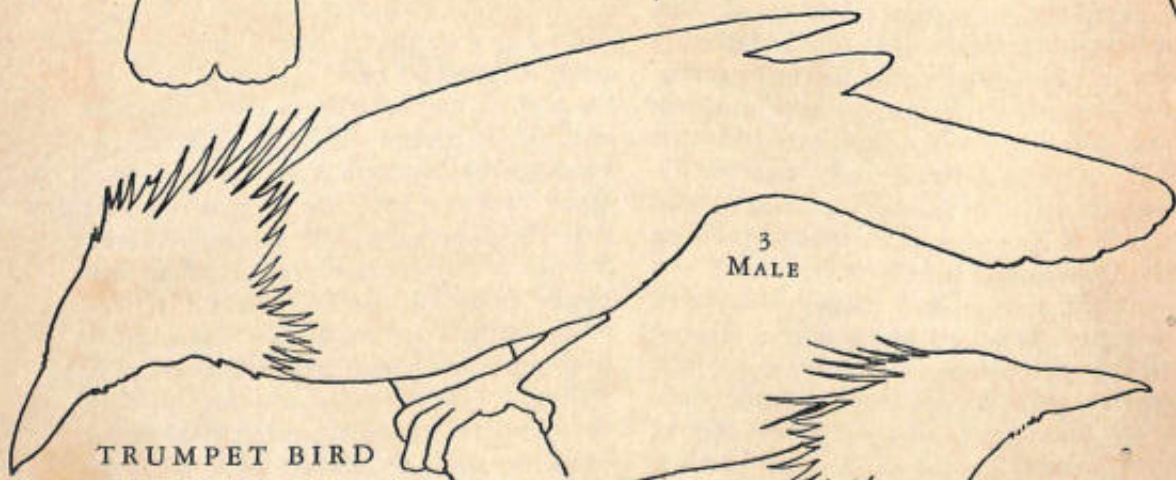
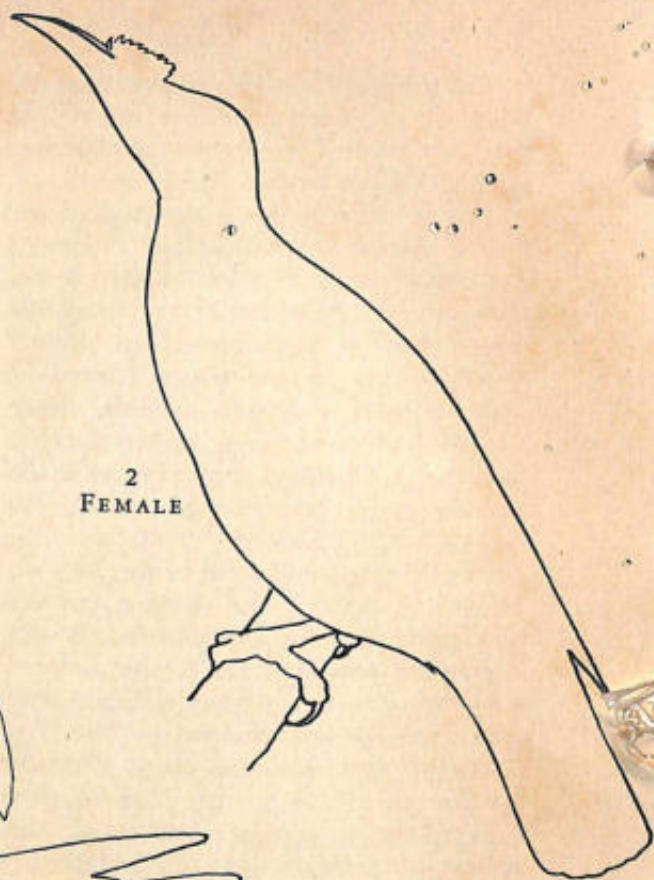
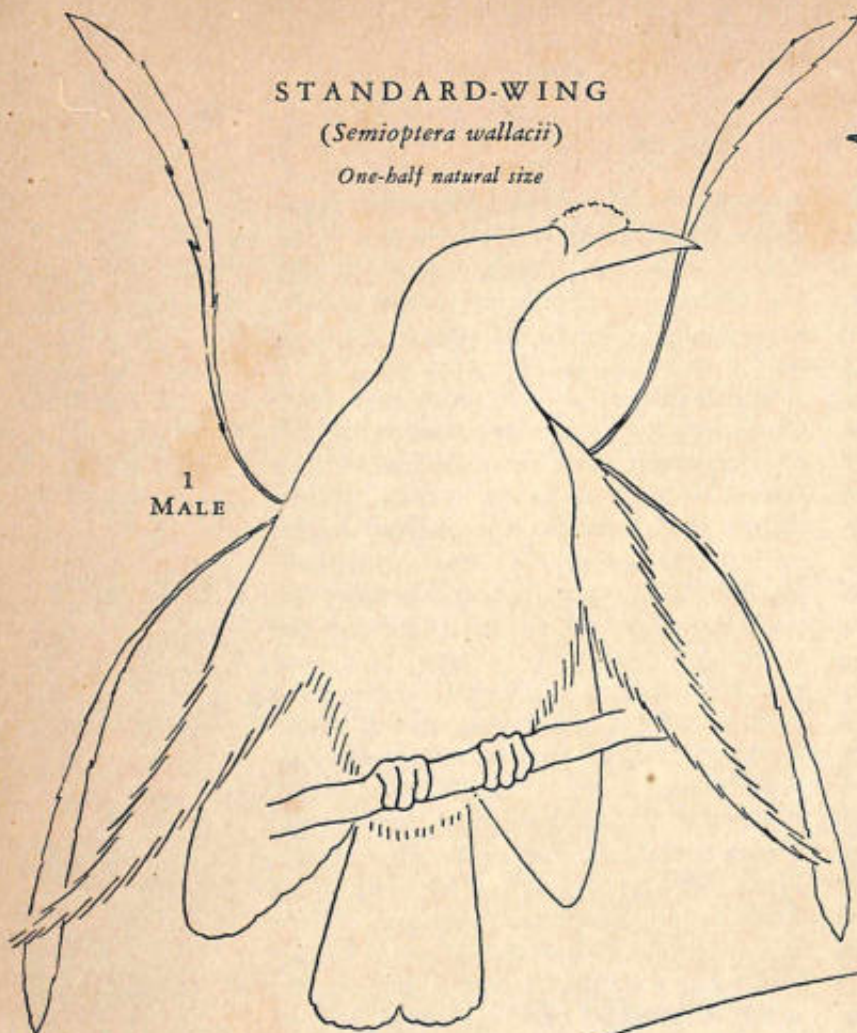
the neck of a less pointed form than those of the Dorey examples. It is certainly distinct from the *M. keraudreni* of Dorey, and therefore will warrant a new specific name being given to it; and I now propose that of *Manucodia gouldii*."

The exploration of south-east New Guinea provided the opportunity of describing three more new species and the status of these is still in doubt. Firstly Sharpe introduced *P. jamesii* from Aleya, near Yule Island, and was induced to abandon it as being inseparable from the typical *keraudreni*. A little later he described a *P. hunsteini*, a larger bird, supposed to have come from East Cape but later traced to the D'Entrecasteaux group. A very beautiful bird was then received from Hunstein from the heights of the Astrolabe Range and this Finsch and Meyer named *P. purpureoviolacea*, writing: "This species differs from *P. keraudreni* in the uniform coloration of the wings and back, and also in the brilliancy and nuance of the colour, besides in the much lengthened head and neck feathers. From *P. hunsteini*, it differs in its smaller size, which agrees with that of *P. keraudreni*, moreover, there is no blue in *P. hunsteini*, and the head is oil-green, whereas it is bluish-green in *P. purpureoviolacea*. Sharpe is of opinion that *P. hunsteini* comes from Normanby Island." A few years later Tristram named *Manucodia thomsoni* from the D'Entrecasteaux I., writing: "This species may at once be distinguished by its oily green resplendent head, in marked contrast with the dark purple of the rest of the body. The wing coverts are of a lustrous purple, which is not so bright as on the body, owing to the dense mass of filamentous feathers with which it is covered above and below." This proved to be *hunsteini*, and Sharpe pointed out that it came from Fergusson Island, and that its greatest peculiarity was the "hen tail" formation not seen in

STANDARD-WING

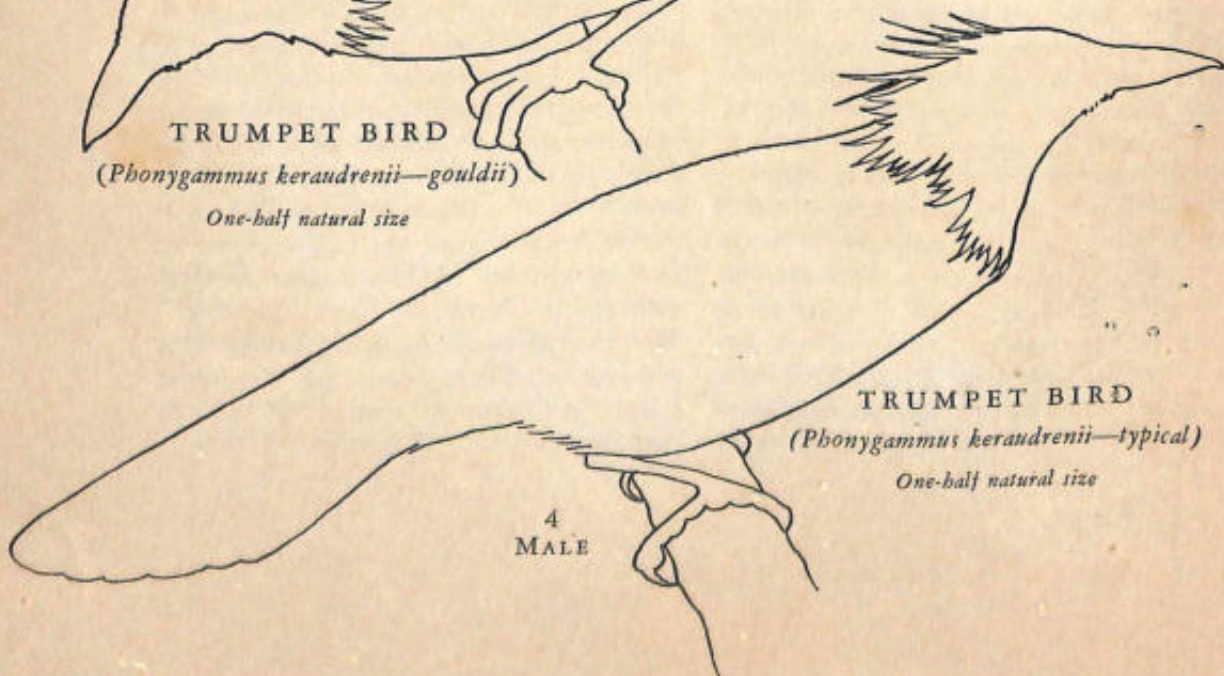
(*Semioptera wallacii*)

One-half natural size



TRUMPET BIRD
(*Phonygammus keraudrenii-gouldii*)

One-half natural size



TRUMPET BIRD
(*Phonygammus keraudrenii-typical*)
One-half natural size



L. J. Gould

any other species of *Phonygammus*, but known in *Manucodia*. An excellent review was published by Rothschild and Hartert in 1903: "We find that it is perfectly correct to separate four forms, but, in view of the coloration of the young, and of the similarity of the old birds, together with the fact that they are geographical representatives, we prefer now to treat them merely as subspecies. Of three of the forms—namely, of *keraudreni*, *jamesi* and *bunsteini*—we have the birds in the first and transitional plumages, and our material shows that the first plumage of all (presumably also that of *P. gouldi*) is raven-black (black with a purplish tinge). Then follows as a rule a more or less greenish plumage, while the really old birds alone have the (more or less) beautiful steel-blue or purple colours, which are only absent in *P. gouldi*.

"(1) *P. k. keraudreni*. Dorey. The two females may be described as steel-blue with a greenish sheen, the wings glossed with purple, while the male is almost without a greenish sheen, more blue and almost purplish blue. A male from the Aru I. has the upper side very strongly glossed with purple.

"(2) *P. k. gouldi*. Cape York. Altogether steel-green, and never developing any pure blue or purple colours; the female still more greenish, somewhat oily in appearance.

"(3) *P. k. jamesi*. The fully adult is very conspicuous by its splendid shining green and very long neck feathers and occipital feathers, purplish-blue back and reddish-violet wings and tail. The less old birds closely resemble *keraudreni*, but the neck feathers are much greener, while the raven-black young bird is like that of *keraudreni*.

"(4) *P. k. bunsteini*. The large size (long wing) and distinctly boat-shaped tail of adult birds, easily distinguish this form from the rest. Head and neck dark green with an oily lustre, rest of plumage deep dark-violet; young raven-black as in the others."

Ogilvie-Grant opposed the suppression of *purpureoviolacea* in favour of *jamesi* (which he however wrongly placed under typical *keraudreni*), regarding the former "as a highland form and having the head and neck steel-green, and the rest of the upper parts, including the rump and upper tail coverts, shining violet purple, the two colours being in marked contrast to one another; *P. keraudreni* has the head and neck steel-blue or greenish like the upper parts, including the rump and upper tail coverts, and sometimes inclines to purplish on the secondaries, but there is no strongly marked contrast between the colouring of these parts as in *P. purpureoviolacea*. The feathers of the head and neck in the adult are of a more steel-blue colour when freshly moulted, becoming greenish with wear, but there is also some individual variation. The present form has the neck-hackles longer and wider than in the typical one, whose measurements in males varies from 152-165 mm., in females from 148-161 mm. In *P. purpureoviolacea* males vary from 160-170 mm., females from 153-164 mm." Reichenow gave a name to the bird from Lordberg in the Sepik district, *neumanni*, as similar to the typical form, but with the lower back, rump and upper tail coverts dull violet agreeing with the colour of the wings and tail, not steel blue or greenish blue as in *P. keraudreni*. Recently Greenway has named a subspecies *mayri* from the Morobe district.

THE CURL-CRESTED MANUCODE

Plate xxii, Fig. 3

The most beautiful and bizarre (if such a combination can be allowed) of the Manucodes was described by Sclater some seventy years ago who called it *Manucodia comrii*, after "Dr. Comrie, who obtained a single specimen of this fine bird in May 1874 in Huon Gulf. It was shot flying amongst the trees in the scrubby forest about a quarter of a mile from the coast.

"This is by far the finest and largest of the peculiar genus now generally termed *Manucodia* (formerly *Phonygama*) yet discovered. It is immediately distinguishable from *M. chalybeia* and *M. atra* by its much larger size and longer bill, which is deeply sulcated at the nostrils. The characteristic curling of the feathers is extended to a greater degree than in *M. chalybeia*, and pervades the whole of the head and neck. The feathers of the abdomen are black at the base, broadly margined with purple. Total length 17 inches, wing 9.5 in., tail 7 in., bill to gape 2.2 in., tarsus 1.7 inches."

The bird was later found to live on the islands of the D'Entrecasteaux Archipelago, and it has been considered that the locality given by Dr. Comrie was erroneous. It reads very circumstantially, however. Nothing has been recorded of its habits.

On account of its size and curly feathering this species has been given a genus *Eucorax* which may be defined thus. A

very much larger and bulkier bird with a mass of curls on its head, and the body feathers both above and below strongly crisped, the tail boat-shaped and rounded, of broad feathers, the two central feathers curiously twisted.

The bill is very large and stout, sharply hooked, posteriorly notched, laterally a little compressed, deep, culmen rounded, long nasal groove along which the frontal feathers extend until they almost conceal the nostrils; there is a large interramal space which is fully feathered, the gonys short, ascending. The wing has the first primary short, about equal to half the length of the sixth which is longest, the fifth, fourth, third and second decreasing in turn; the secondaries are broad and rounded, reaching to the ninth primary, the primaries pointed, the first narrow, the succeeding ones successively a little broader, the wing coverts being very large. The tail is composed of broad feathers. The legs are short, stout and the toes strong. The colouring of the only species is black with a deep purple sheen over all in places showing a green or even blue reflection. Bill 62 mm., wing 240 mm., tail 178 mm., tarsus 53 mm. This bird lives on the islands of the D'Entrecasteaux Group and also on the Trobriands, an unexpected place after its non-appearance on the mainland adjacent. The Trobriand form has been named as being smaller.

FALSE BIRDS OF PARADISE

WHILE the association of the birds preceding must be regarded as somewhat unnatural, there still remain a few birds which have been classed among the Birds of Paradise, though obviously not related in any way. These are here dealt with under the above heading, but it may be a long time before these birds are dissevered and correctly located. Newton, a harsh but just critic, wrote half a century ago regarding Le Vaillant's works: "Between 1803 and 1806 Le Vaillant also published in just the same style two volumes with the title *Histoire Naturelle des Oiseaux de Paradis et des Rolliers, suivie de celle des Toucans et des Barbus*, an assemblage of forms, which, miscellaneous as it is, was surpassed in incongruity by a fourth work

on the same scale, the *Histoire Naturelle des Promerops et des Guepiers, des Couroucous et des Touracos*, for herein are found Jays, Waxwings, the Cock-of-the-Rock (*Rupicola*) and what not besides." Be it noted that in this latter work were included some birds now regarded as Birds of Paradise. But this is quoted to draw attention to a similar incongruity of classification of the Birds of Paradise, and that the present article deals with the "what not besides."

The four following birds, the Enamelled, Loria's, Shield Bill and Standard Wing, are all peculiar in that they show little likeness to any of the birds previously discussed as Paradise-birds, and still less to one another.

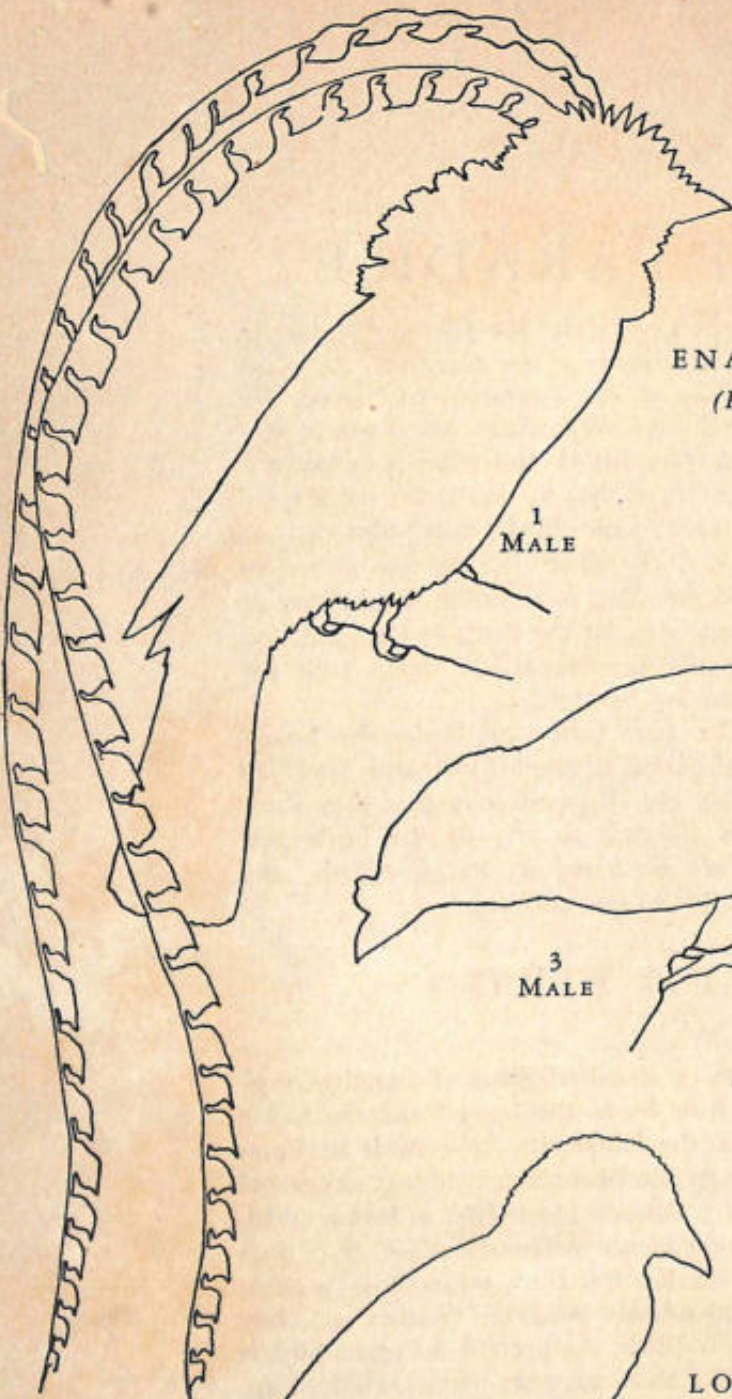
THE ENAMELLED BIRD

Plate xxiv, Figs. 1 and 2

This was introduced as the King of Saxony's Bird of Paradise and was rightly called "marvellous", as it possesses two long processes from the back of the head which look very unlike feathers. It would appear that the reason for calling it a Bird of Paradise was that it came from New Guinea and was the owner of a most wonderful adornment. From each side of the back of the head is produced an appendage twice the length of the bird which bears enamel processes on one side of the shaft only, and these are curiously shaped like small flags enamelled pale blue on the outside and dull brown on the inner. These must be seen to be believed, and examined closely before they are acceptable as feathers. Without these ornamental plumes the bird itself shows no resemblance to any of the possible

series of so-called Birds of Paradise, e.g., the Rifle-Birds, the Long Tails, the Sickle Bills, the Kings, the true Birds of Paradise or the Manucodes. It was suggested that it looked more like a Bower Bird, but even here it has no place as it does not recall a Cat Bird, a Gardener, a Satin Bird, Regent Bird or Golden or Grey Bower Birds. At present no other bird is known that suggests close relationship, while nothing seems to be recorded of its habits.

The bird is small and recalls the Australian Shrike Thrushes in size, and the male is velvety black on the head, throat and back, suggesting a cape, the lower back brown with grey fringes, wing coverts brown, primaries brown with a broad yellowish basal band, tail brown, under-surface brownish yellow.

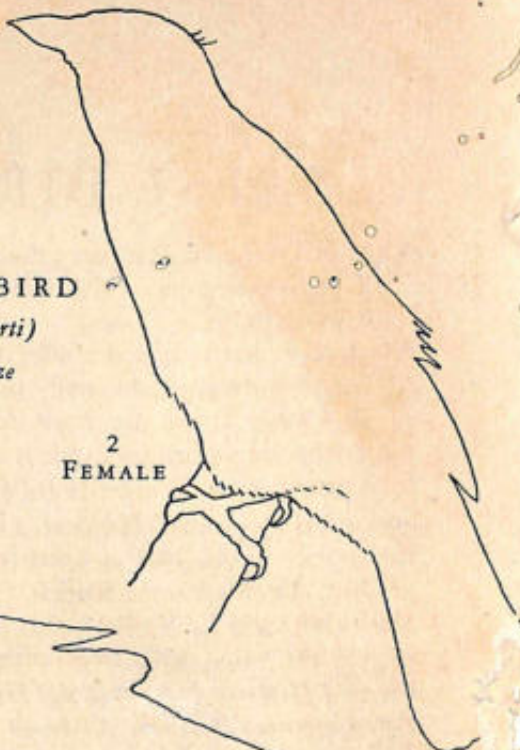


ENAMELLED BIRD

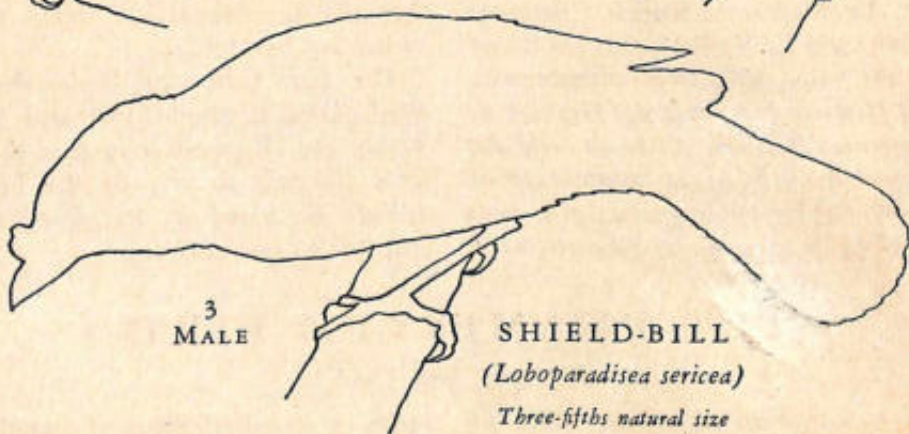
(*Pteridophora alberti*)

One-half natural size

1
MALE



2
FEMALE

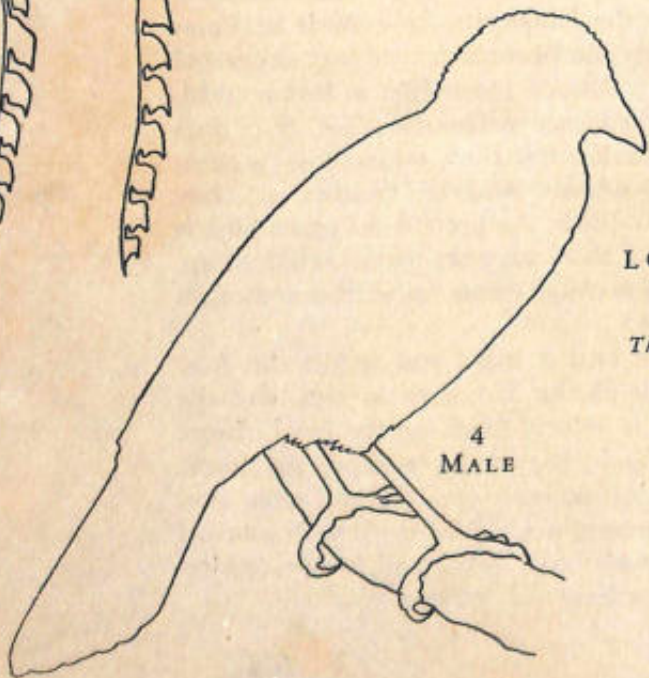


3
MALE

SHIELD-BILL

(*Loboparadisea sericea*)

Three-fifths natural size

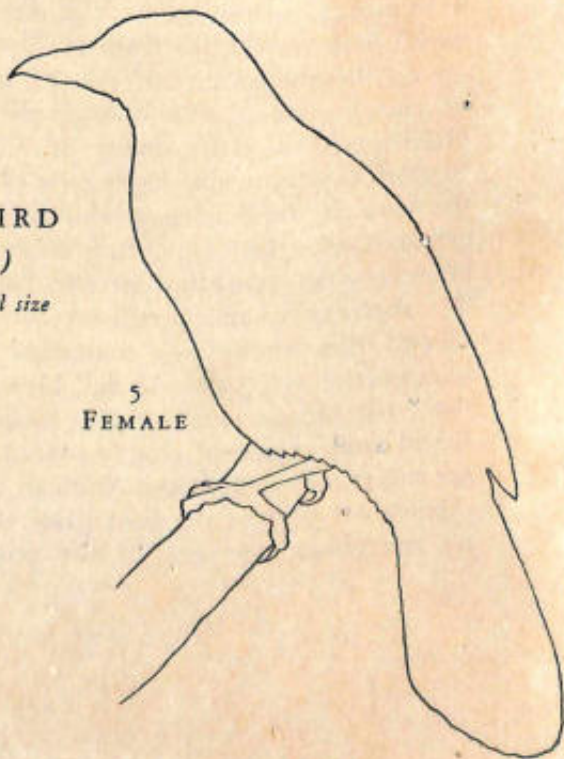


4
MALE

LORIA'S BIRD

(*Loria loriae*)

Three-fifths natural size



5
FEMALE



Richard Meinertzhagen

In detail the bill is small, strongly laterally compressed, culmen keeled and arched, tip small, sharp, slight posterior notch, nasal groove hidden by projecting black tuft of feathers, interramal space short, gonys long, a little ascending. The wing has the wing feathers pointed, fourth and fifth subequal and longest, third longer than sixth, second shorter than seventh but longer than secondaries; the first short and narrow and attenuated at the tip about half the length of the second also slightly attenuate; the secondaries long and broad of even length save the innermost couple. Tail long and square, feathers medium, tail coverts nearly half the length of the tail. Legs medium, stout, front toes small and slender, claws long, hind toe stouter, claw stronger, front of leg strongly scuted, back bilaminate but scaled anteriorly. Bill and feet black; eye brown. Bill 24 mm., wing 130 mm., tail 95 mm., tarsus 32 mm.

The ornamental plumes can scarcely be described as a long shaft springs out from behind and above the eye, and this, reaching backwards more than twice the length of the body, bears on one side a series of squarish enamel plates about 9 mm. each way. Towards the tip these plates become smaller and more triangular until they leave a bare tip. The present one measures 415 mm., with 133 plates of which 25 are full size; these plates have a little bristly tip at the lower corner. The outside of each plate is a bright pale enamel blue, the inside dark shining brown.

The adult male above described came from the Mount Hagen district whence, as I am writing, living specimens have reached Sydney, New South Wales. A young male from the Purari-Ramu Divide, South-East Bismarck Range, 7,000/8,000 ft., collected by F. Shaw Meyer 2 June 1940, has the iris brown, bill black, inside of mouth greenish, feet dark grey, stomach contents green berries. The head is

flattened, feathers small, greyish olive brown with darker tips giving it a scaly appearance, the back much darker, tips larger, paler, producing a sub-scalloped look, rump and upper tail coverts a little paler, tail dark olive brown, the feathers sharply pointed, tail square; primaries uniform brown, bend of wing yellowish, under wing coverts brown with yellowish edges, inner base of primaries fawn; throat feathers whitish, narrowly banded with dark brown, above the eyes and behind a narrow stripe of feathers with whitish tips, cheeks and ear coverts brown with whitish medial streaks; under-surface from throat to under tail coverts creamy white boldly marked with brown horseshoe markings, the flank feathers lengthened and disintegrating and fawn barred with brown, under tail coverts yellowish fawn. From the nape behind the eye on each side projects one stiff narrow feather about 20 mm. long by 2 mm. wide, the forerunner of the wonderful ornamental plume later achieved. Bill from nasal groove 12 mm., wing 130 mm., tail 100 mm., tarsus 32 mm. Female same date, plate and collector; coloration similar in detail, tail a little shorter, feathers not so pointed; back feathers fuller and longer, head a little greyer contrasting more with back; ornamental feathers appearing as minute feathers 10 mm. by 1 mm. only.

The species was first described from the Amberno River, but recently it has been decided that the correct locality was the Weyland Mountains, but now it has turned up more or less commonly in the Mid Sepik, Bismarck Range and Mt. Hagen district, and the northern slopes of Mt. Wilhelmina. From the last-named locality Rand reported nine females only from 1,500 M. to 2,800 M. with wing measurements of 110-115 mm. "There is a slight correlation between increase in size and increase in altitude. This series

differs somewhat from Weyland Mountains series only in the slightly darker back, slightly heavier barring on the under parts especially posteriorly, and the somewhat

more vividly coloured under tail coverts. No adult males were seen." Rothschild had named a race from a female from the Schraderberg.

LORIA'S BIRD

Plate xxiv, Figs. 4 and 5

A strange female bird was collected by the Italian Dr. L. Loria and sent home to Salvadori, who regarded it as a Bird of Paradise but of a new kind, and called it after the finder *Loria loriae*. At the same time it was collected by Macgregor's associates, Captain Armit and Mr. Guise, and was described a little later by De Vis, who wrote: "We have a second species of *Cnemophilus*, a genus which, in deference to the opinion of eminent ornithologists, has been transferred provisionally to the Birds of Paradise, a further addition to that splendid family. Unfortunately, being wholly black, and wanting the crest which forms so striking a feature in *C. macgregorii*, it has less picturesque attractions than its congener." This species was dedicated, by desire, to Mary, Lady Macgregor, but Salvadori's description was published earlier.

Sharpe stated that there seemed to be a slight distinction between Loria's bird and the Lady Macgregor, so retained the latter name but called it a Bower Bird. Recently it has been re-transferred to the Birds of Paradise, which indicates that its relationships are very obscure. There seems little doubt that it has nothing much to do with any sort of Bird of Paradise already treated, and before De Vis knew that Salvadori had introduced a genus for it he had determined that it was not congeneric with *Cnemophilus*, and had proposed in Mss a new genus for it. Little seems to have been recorded of its habits, although it appears to live at medium altitudes below 6,000 feet. From its structure it seems a

skulking ground bird, having a rather long broad keeled bill, with long legs and strong feet, with a very rounded wing and a long rounded tail, and may be a derivative of the flycatcher series like the Fijian "Paradise Bird". The technical description of the genus is drawn up from specimens from the Queensland Museum, the male from Mt. Scratchley 4,000 feet. Bird comparatively small with a wing length of about four inches; male blackish above and below without any ornamentation, female greenish. The bill is rather long, culmen curved, keeled, hooked and toothed at tip, broad at base, nostrils oval in a small nasal groove but not concealed by scale-like feathers of the forehead which approach on the groove, lower mandible smaller, fitting inside expanded edges of upper mandible, interramal space small, feathered; from gape a narrow strip of naked skin extends below, beyond the eye developing a small oblique wattle. (A similar streak occurs in some Honey Eaters in New Guinea.) The wing is rather long and rounded, the first primary is not much more than half the length of the second but less than half the third, which is equal to the ninth, the fourth to the seventh subequal, the fifth and sixth slightly exceeding the other two, the secondaries long and broader, longer than the second primary and about equal to the tenth, the inner secondaries (tertials) a little shorter, narrower and pointed. The tail is long, about three quarters the length of the wing, wedge-shaped, feathers rounded. The legs are long and stout, the

front almost smooth, only showing scutation obscurely, back bilaminate; feet strong, claws short curved, the hind toe and claw long and strong, longer than the middle toe and claw. The coloration of the male is blackish brown above, an iridescent purple spot above the eye and a similar one on each side of the forehead composed of appressed scale-like feathers approaching on to the nasal groove. The head feathers are small, rather velvety, the back feathers soft and velvety with a faint bluish shimmer. The wing feathers are dark brown, the edges bluish, but the inner secondaries show a purplish sheen. The tail also shows a bluish gloss, underside as of wings dark brown. The under-surface velvety black glossed with purple. Bill black, eye brown, legs dark brown (said to be dark green in life). Bill from nasal groove 12 mm., wing 100 mm., tail 78 mm., tarsus 40 mm. The female has the head and neck pale green, the feathers edged with brown, giving a barred appearance; back dark olive barred as above, the barring fading out on the rump and upper tail coverts, the tail red brown, margins olive tinged; primaries brown with outer edges reddish brown; throat and breast pale green feathers brown edged, a little paler than the head, middle of abdomen washed with yellow, sides of ab-

domen brown, as under tail coverts and thighs; under wing coverts buff, inner wing lining pinkish red. Wing 97 mm.

"The young male is like the female, but the base of its beak is, as in the adult male, considerably wider. Change of plumage begins by the replacement of all the ordinary post-nasal feathers by the budding scale feathers of the adult, and by the appearance of black feathers on the under side of the wing." (De Vis.)

This bird was reported from the Arfak Mts. and then from the Utakwa River, of which Ogilvie-Grant wrote: "The specimens appear to be perfectly similar to typical examples." Stresemann reported it from the Schraderberg also as being inseparable, but later named it as the reflections seemed different, and then Junge named the Snow Mountain birds. Rand found it on the northern slopes of Mount Wilhelmina, and concluded: "There is no altitudinal variation in size. Compared with birds from south-east New Guinea the sheen on the wing is slightly more greenish blue but the difference is small. This bird was usually sitting quietly or moving slowly about in the leafy substage where it feeds on fruit."

It will be concluded that this form shows very little variation throughout its range from east to west.

THE SHIELD-BILL

Plate xxiv, Fig. 3

Rothschild described this little bird, which does not appear to show any character associating it with any other so-called Bird of Paradise. His description reads: "The type of this new genus (*Loboparadisea*) differs from all others in having two wattles, which entirely cover the basal half of the beak, except a narrow ridge of the culmen. Size small, bill very broad at base and short. feathers of under

parts and rump decomposed and with a strong satiny gloss. No lengthened ornamental plumes. Tip of tail rounded. The species (*sericea*) was itemised head brown, hind neck and back rufous chestnut, with a slight olive tinge; rump bright yellow, with a beautiful silky sheen, wings and upper wing coverts ruddy chestnut; primaries boldly tipped with black and having the shafts brick red; tail and upper tail

coverts reddish chestnut. Underside bright yellow and most beautifully silky. Thighs olive-brown. Under wing coverts and underside of primaries brownish cinnamon. Bill with two large wattles reaching halfway down from the base, dull blue with yellow tips. Wing 91 mm., tail 58 mm., bill 21 mm. Bought from natives at Koeroedoe, Dutch New Guinea."

Later it was explained that Koeroedoe was on the northern coast of New Guinea and was not Korrido in Geelvink Bay. Also that the tarsus was 34 mm. long and the total length 170 mm. According to later authority the locality should have been Kurudu Island, east of Japen, and the bird had probably come from the Weyland Mts., a long way to the normal student. Sharpe redescribed the same specimen and commented that it looked more like a Bower Bird, but that was not certain, and gave no details of the structure for guidance. Note that no particulars of wing, bill, tail, or leg are given so that its relationship was very obscure. Meek collected it on Mount Goliath and the B.O.U. Jubilee Expedition on the Utakwa River, Mayr in the Herzog Mts., and Stein in the Weyland Mts. Ogilvie-Grant noted that the adult males differed from the above description in that the upper parts were washed with golden olive, and that

the original skins had been dried over fire and somewhat scorched and discoloured. The adult female has the lower back, rump and entire under parts pale golden, while young birds, both male and female in first plumage have the entire upper parts, including the crown, dark olive brown with darker margins to the feathers, giving these parts a somewhat squamose appearance; the under parts are yellowish buff, inclining to rufous on the chest and with darker edges to the feathers, producing a streaked appearance. At this age the nasal lappets are not visible in the male. In the second year's plumage, both male and female have the lower back, rump and under parts mixed with pale golden feathers like those of the adult female, but the males are easily distinguished from the females by their partially developed nasal lappets. He called it a beautiful little Bird of Paradise but gave no reasons for so doing. Rothschild in a paper by Hartert and others recorded a series of 8 adult males, 3 females, 3 young females from Kunupi, with wing measurements of adult males as 90-94 mm., females 93-98 mm., commenting: "The female is thus larger than the male, which is only known otherwise among the Passeres in the case of *Pristorbamphus versteri*."

THE STANDARD WING

Plate XXIII, Figs. 1 and 2

This is otherwise known as Wallace's Bird of Paradise, but this time there is a sound basis for denying any relationship with any of the groups of so-called Birds of Paradise, as it shows in itself its apparent derivation. At first sight to anyone familiar with Australian birds it suggests the bird forms known as Friar Birds, a rather bad name, as that was selected for the most abnormal development in the opposite direction to that taken by the

Standard Wing. Curiously enough the Friar Bird is the most southern form, while the Standard Wing is the most northern one. Furthermore, Wallace's bird is the only so-called Paradise-bird that occurs outside the zoological limits of New Guinea proper.

It is a grey brown bird above, with the head feathers closely appressed and a tuft of feathers protruding and hiding the nostrils; there is a breast shield of glossy

green feathers but otherwise the feathering is normal save for its name-feature. This is the projection from the bend of the wing of two long white feathers on each side; these plumes are webbed on both sides, but the webs are very narrow basally and widen gently to the tips where they are still narrow; these standards are capable of erection. It must be remembered that when Wallace met with this bird he was enthusiastically seeking for Birds of Paradise and his notes show this: On the island of Batjan, "just as I got home, I overtook Ali returning from shooting, with some birds hanging from his belt. He seemed much pleased, and said, 'Look here, Sir, what a curious bird,' holding out what at first completely puzzled me. I saw a bird with a mass of splendid green feathers on its breast, elongated into two glittering tufts; but what I could not understand was a pair of long white feathers, which stuck straight out from each shoulder. Ali assured me that the bird stuck them out this way itself, when fluttering its wings, and that they had remained so without his touching them. On lifting the wing coverts these feathers are seen to arise from two tubular horny sheaths, which diverge from near the point of junction of the carpal bones. The *Semioptera* frequents the lower branches of the virgin forests, and is almost constantly in motion. It flies from branch to branch, and clings to the twigs and even to the vertical smooth trunks almost as easily as a Woodpecker. It continually utters a harsh croaking cry, something between that of *Paradisea apoda* and the more musical cry of *Cicinnurus regius*. The males, at short intervals, open and flutter their wings, erect the long shoulder feathers, and expand the elegant shields on each side of the breast. Like the Birds of Paradise, the females and young birds far outnumber the fully plumaged birds, which renders it probable that the extra-

ordinary accessory plumes are not fully developed until the third or fourth year. The bird seems to feed principally upon fruit, but it probably takes insects occasionally. I have obtained a few examples of apparently the same bird from Gilolo, but in these the crown is of a more decided violet hue, and the plumes of the breast are much larger."

Goodfellow made a special trip to Batjan, of which he states: "Having been almost all over the globe, I think I can say that these islands (the Moluccas) are the most exquisite in all this world of ours, and Batjan is perhaps the most beautiful of them all. The island has only a very small population, including five whites (in 1926), and is everywhere covered with dense virgin jungle, right to the top of the mountains; the most conspicuous peak being Goenong Zibella. Failing to find anyone there to give me information about the bird, I went to Ternate, where I was told the birds occurred at Patani, south-east Halmaheira (Halmaheira is called on our maps Gilolo, or rather Djailolo), but Gilolo is only a small town on the western side. I got no information on the way until I reached Tobello on the north coast, where the Dutch have a military post. There I came across a man who had been a plume hunter in New Guinea. He knew the bird and described it and from him I learnt that the local name was 'Vecca-vecca' (nearly all birds' names are doubled out there), that they were rare and would be difficult to catch alive. So I continued to Patani and called upon the headman who at once said, 'Oh, you mean the Wacca-wacca, there are many here,' but could not imagine what I wanted with those. Soon after they were pointed out, large black crows. I tried to explain without much success until I made a sketch when one old man exclaimed 'Burong Plat' and said that years ago hunters had come to Tidore to

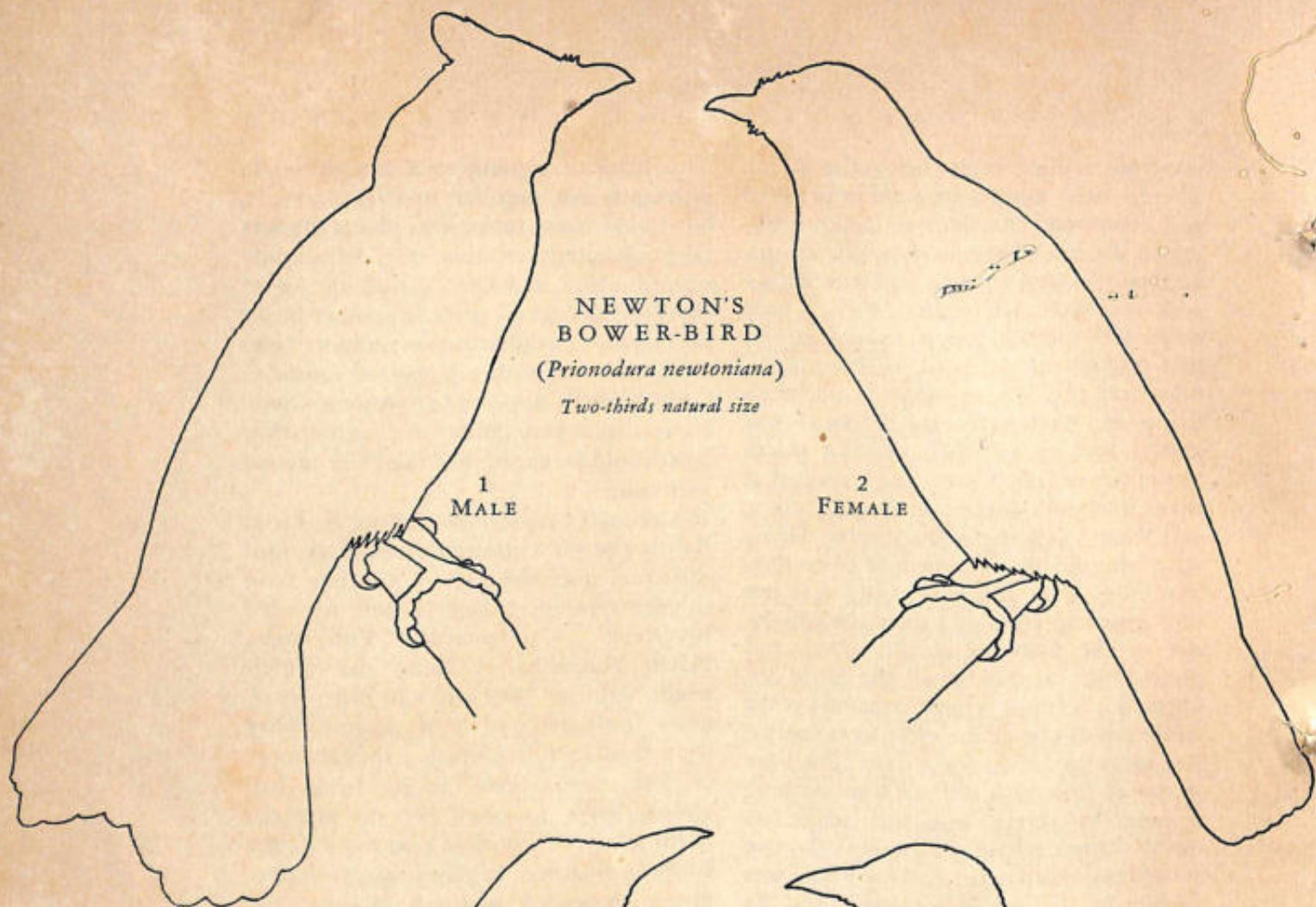
get them. I sent out hunters in every direction but they were very uninterested, being purely coast dwellers, cultivating little beyond coconuts, and feeding chiefly on sago and fish. They had no knowledge of catching birds and did not go into the jungle, and the whole of the interior seemed to be uninhabited by any tribes. A few reports of solitary birds came in and I saw three or four high up in the trees, but no report of feeding trees or dancing places was offered. After a fortnight's daily search in the hills, wet and miserable through sleeping out in the rain I had abandoned all hope, when one night a man came to me mysteriously, and said he knew a place where they abounded. How many did I want, and what would I pay for them? etc. All this seemed to be too good to be true, as he was not willing to take me along with him. No news for nearly a fortnight and the boat was due in another week and I was ready to depart without achieving my object when the man turned up again. He said the birds were still there, but he could not catch them, so came to enlist my help. I arranged to go with him early the next morning, and he insisted that we must start before daylight, so that the villagers should not see the way we went. Before daybreak we were off, the party consisting of the man and his young son, myself and my Indian servant. After the same hard climbing up and down, perhaps three hours of it, we came to a stunted kind of jungle. A few enormous trees grew here and there, but the majority were saplings of 30 to 40 feet high, straight, and with few branches, and these quite short; very little undergrowth, in some places none at all. Perhaps after being disappointed so many times, my surprise may be imagined when I saw in comparatively low trees, at the very least thirty Wallace's Birds. I really could hardly believe my eyes, and out of all this number possibly not more

than two females, or birds in brown plumage. The others seemed to be all fully adult males. My guide had certainly done his best to catch them. He must have put scores of limed twigs, some being long tapering bamboos 20 or more feet long, with lime on the extreme ends. This bird lime is made out of the sap of the bread fruit tree, and in the Aru Islands I have myself caught *apodas* with it. In the present case I think it had been badly prepared, as he said birds had repeatedly settled on it, and were not held. The birds were all constantly on the move, flying backwards and forwards from tree to tree with a great fluttering of their wings, and at times hanging in all sorts of positions from the slender branches, some turning round and round like a cartwheel, and all the time making a variety of squawks and calls. Opposite to Wallace's experience, I did not see one half-plumaged bird among any I came across. It may be that the females were away nesting during June and July, and that the one or two entirely brown birds which I took to be females were really young males. Again I found that they are very insectivorous and certainly prefer green-coloured insects, with a pronounced partiality for the large soft-bodied grasshoppers, nearly 5 or 6 inches long, which live on the branches of the coconut palms. It was a lesson in anatomy to watch the expert way they dissected these insects. Looking at the birds from below, in the jungle, they appeared to be so very light in colour, almost white. The under sides of the wing are whitish, but I don't think that accounted for it all. After we had caught the first bird, the man remarked, 'There must be two kinds, for the others are white.' I saw some of the birds with their green breast shields elevated, not horizontally, but perpendicularly, so that the head only is seen looking through at the deep V-shaped base of green feathers. At this time the long shoulder plumes

stand out at right angles below the shield. These whitish plumes are constantly raised and depressed. The short scale-like feathers on the top of the head, which are silvery purple, also seem to undulate with a curious effect. Of course, this I only noticed in captivity, as it requires a certain position of the head to show it off, otherwise this colour effect is not even suspected. As I have said before, I was always looking for their dancing places in the jungle, but I now feel certain that these low trees formed a dancing place, and what I saw there, the display, otherwise why did they frequent it more than any other spot, for it certainly was not their breeding ground? I spent the remainder of the first day at this place, and noticed that at midday all the birds disappeared. A few, I believe, remained in the dense top of one of the great trees nearby, and came out again for a short time later in the afternoon. It did not take me long to note that certain trees were more frequented than others, so the next day we started to put up nets . . . As one bird was caught in the net it screamed, and its screams brought all the other birds around.

This habit of coming to a companion in distress is not peculiar to Paradise-birds, but I have many times seen plume hunters take advantage of this and deliberately wound a bird and keep it tied up out of sight for its cries to attract the other birds. During rain or dull weather no birds came out at all, but with one ray of sunshine, birds suddenly appeared from somewhere. I was at first very doubtful if such restless birds could be caged, but the birds proved very tame."

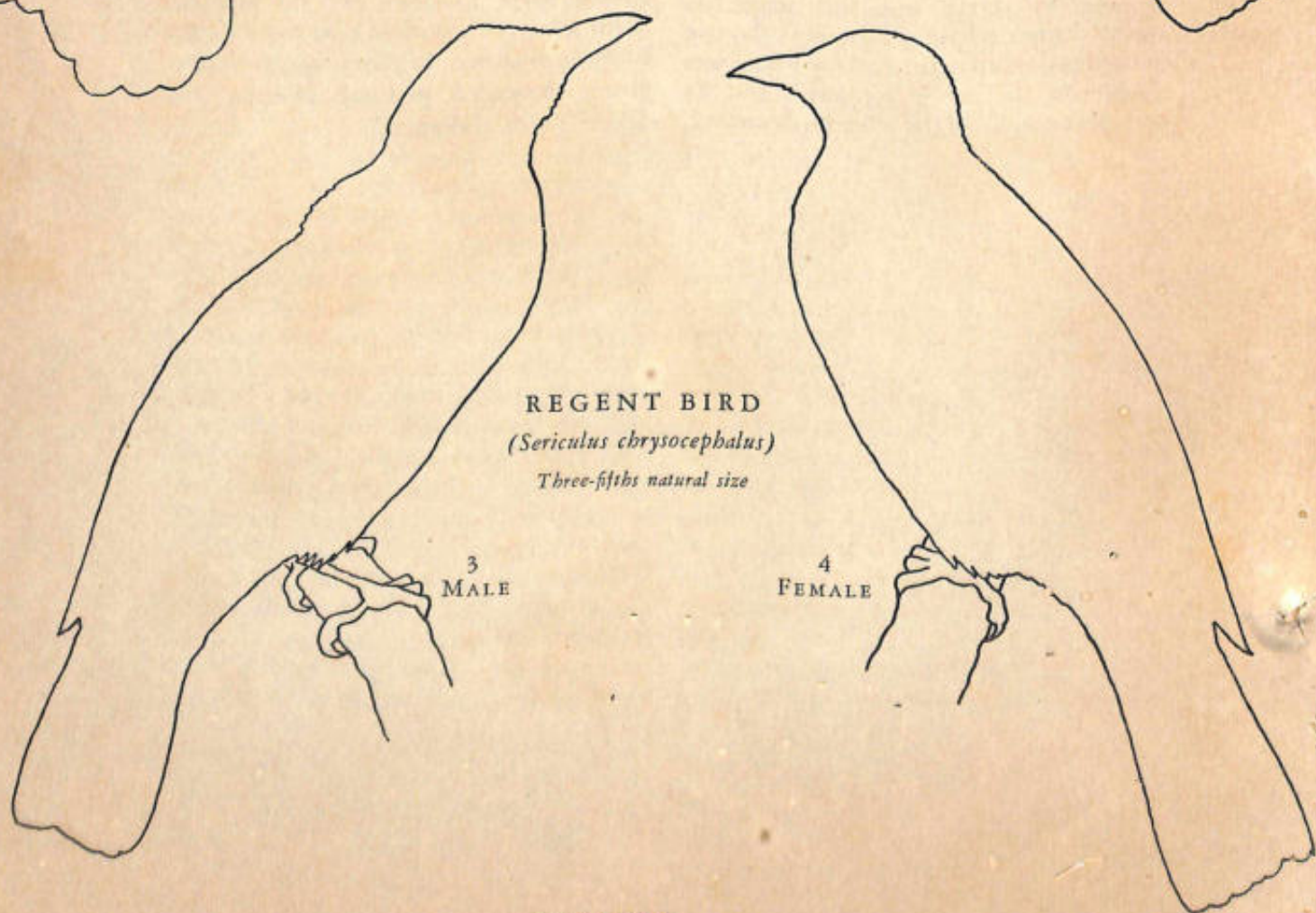
Although Goodfellow did not find it at Batjan (he was collecting live birds), bird collectors since the days of Wallace have secured specimens, and Hartert recorded Bernstein, Guillemard, Vorderman, Platen, Kukenthal, Doherty and Waterstradt, writing: "Doherty sent many specimens from the month of August. They were then in full plumage, though more or less worn. Some young birds had already begun to moult into the plumage of the adults. The Gilolo bird has a darker back and crown in both sexes, longer green elongated pectoral plumes, and darker green abdomen."



NEWTON'S
BOWER-BIRD
(*Prionodura newtoniana*)
Two-thirds natural size

1
MALE

2
FEMALE



REGENT BIRD
(*Sericulus chrysocephalus*)
Three-fifths natural size

3
MALE

4
FEMALE



Lilias Medland

BOWER BIRDS

Family *Ptilonorhynchidae*

Plates XXV to XXVIII

UNDER this heading are classed birds of different structure, which have formed the habit of building playgrounds. These were first discovered in Australia and their habits have been intensively studied by ornithological observers in that country. Gould first published the extraordinary facts, and apparently used the word bower in connection and also Bower Bird and these have been used ever since. Gould placed together the Satin Bower Bird, the Cat Bird, four species of *Chlamydera* and the Regent Bird, as "these appear to me to constitute a very natural group, and to be nearly allied to the *Paradiseidae*."

From this vague statement arose the myth that not only were the so-called Bower Birds related to the Birds of Paradise but actually belonged to the family. The slightest examination of the structure of the birds themselves showed the fallacy of such a position, but they have continued to be associated and are therefore treated in this work. Three groups appear to be represented in Australia, the Cat Bird series to which the Satin Bird may be attached tentatively, the Regent Bird alone but perhaps the Golden may be added, and the *Chlamydera* group. The last-named enters New Guinea, while Cat Birds are also well distributed, but a new group, the Gardeners, live solely in New Guinea, and show peculiar variation. Two other Golden series are difficult to place, save that by colour and form they may be placed alongside the Regent Bird. It is pretty certain that these would never have been associated together save for the bower-building habit, and this is not a phylogenetic character, so later students

will also dissipate the members of this so-called family elsewhere.

The earliest bird to be described was the New Guinea bird, which was first named by Linne as the Golden Roller, and then amended to the Golden Oriole, and referred to the Paradise-birds by Shaw. Then followed the Australian Regent Bird described as a Honey Eater and then as an Oriole, succeeded by the Australian Cat Bird as a Shrike, with the Satin Bird as a Chough. The last-named was elevated to generic rank on account of its form as *Ptilonorhynchus*, and that name is the basis of the family name including all the Bower Birds, although the bird itself is one of most striking appearance unlike every other one. Fortunately it has been most studied and most written about and appears to be the most advanced in its methods so that it is an excellent bird for comparison.

The members of this "Family" are here arranged in subfamilies, beginning with the Regent Bird, which stands out on account of the black and golden yellow coloration but carrying no ornaments. It may be noticed that none of the "Bower Birds" show elongated plumes in any connection, but some develop coloured nape frills, and others long head crests; one has a peculiar crest and some seem to have erectile mantles. On the contrary not one of the Birds of Paradise bears a natural crest, though a number have the head feathers specialised and wear metallic nape frills. The majority of the Bower makers, such as the Gardeners, are very ordinary looking birds save when they develop the glorious crest which some possess. As the

birds themselves show little interrelated connections it is suggested that the bower making has developed coincidentally or perhaps independently, as the extraordinary fact is that it is restricted to birds living in New Guinea and Australia only, and though the original forms may have been similar the finished articles are now very different in many cases. It will be noted that the bowers vary quite a little in structure and also in the decorations, but the chief very notable feature is the different interpretation of the bower's usage. It may be recalled that Gould saw in them edifices to please the female and that in most of the pictures this was emphasised. The very close study of the Satin Bird in Australia has shown that the bower in this case is the pleasure of the male alone, and that the female does not participate in the enjoyment of it in any way. This so far seems to be the case in connection with the bowers of other Australian bower makers, but seemingly does not apply in New Guinea. Whether the New Guinea reports are reliable or not cannot be proved at present, but there seems no reason for doubt in the cases recorded. Some report male and female at the bower while others record them as playgrounds for even more than two. In the future a review may be made, and some kind of reconciliation may be made with the bowers and their uses that may assist in the classification of the bower makers.

Mimicry is a faculty little known in Europe, and European workers cite the case of the American Mocking Bird as something extraordinary and wonderful. Chisholm has shown that mimicry is a common asset of many Australian birds (and probably also those of New Guinea), the Lyre Bird being the greatest mimic in the world, with Bower Birds not very far behind. A few notes only are available elsewhere than in Australia, but

this is a field for exploitation in the future.

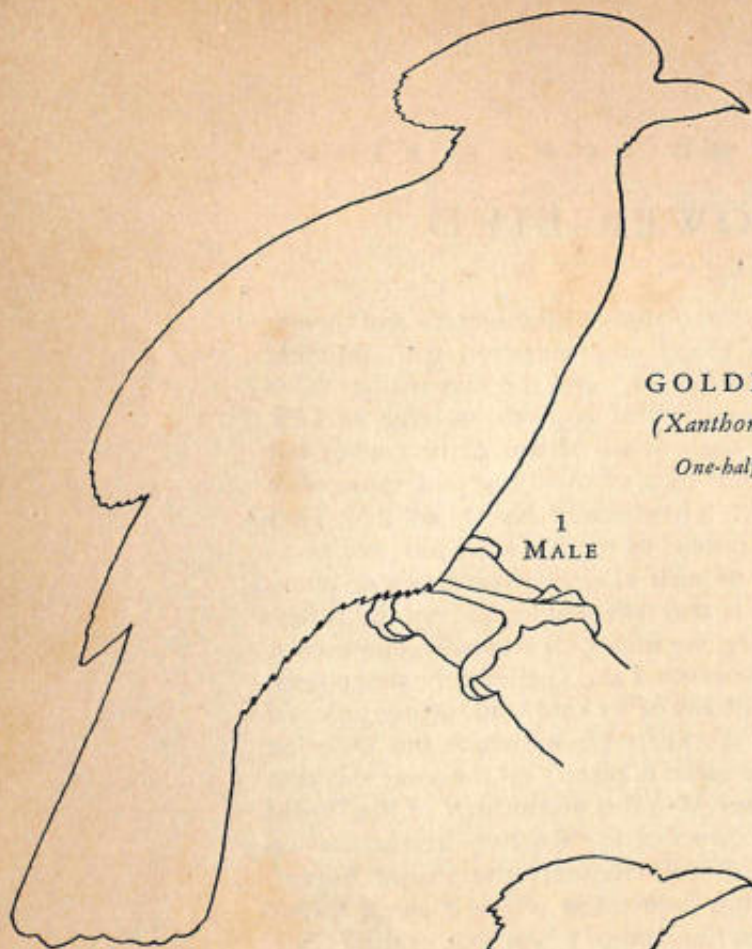
As Chisholm has made this subject his especial study a few quotations may be given from notes in "Birds and Green Places," one of the most fascinating books about bird habits yet written. "We have two world beating groups of mimics. One embraces the bower birds with the spotted bower bird as perhaps the outstanding performer . . . There are at least seven species of these birds in Australia and several others in New Guinea, and practically the whole of them are master-mockers. Yet there is an exception to the rule . . . the handsome regent bird, constructs playhalls on occasions, but has never been known to use vocal mimicry. One of the spotted bower birds precisely mimicked the sound created by sheep scrambling through a wire fence . . . spotted bower birds imitate also the cries or calls of eagles, hawks, butcher birds, magpies and notably the wail of a domestic cat. The satin bower bird is a brilliant mocker but not so consistent in the practice, yet it has been written 'At times the bird seemed to pour harmony from its very soul. It was a miniature lyre-bird, and imitated in a marked degree the calls of the kookaburra (only the first two bars), the butcher bird (which was perfect), and the grating cries of the white cockatoo; but the screeching of the black cockatoo was its masterpiece. The imitation of the crow-shrike and the magpie could hardly be better done, and the peculiar grunt of the native bear was true to nature.' The Toothbilled Cat Bird achieves a high standard of vocal mimicry 'reproduced with startling exactness,' the notes of many birds of the tropics, but his masterpiece of vocal conjuring was the imitating of the whirring of a cicada when held by a bird. Another striking reproduction was the distressed croak of a frog when caught by a snake."

THE REGENT BOWER BIRD

Plate XXV, Figs. 3 and 4

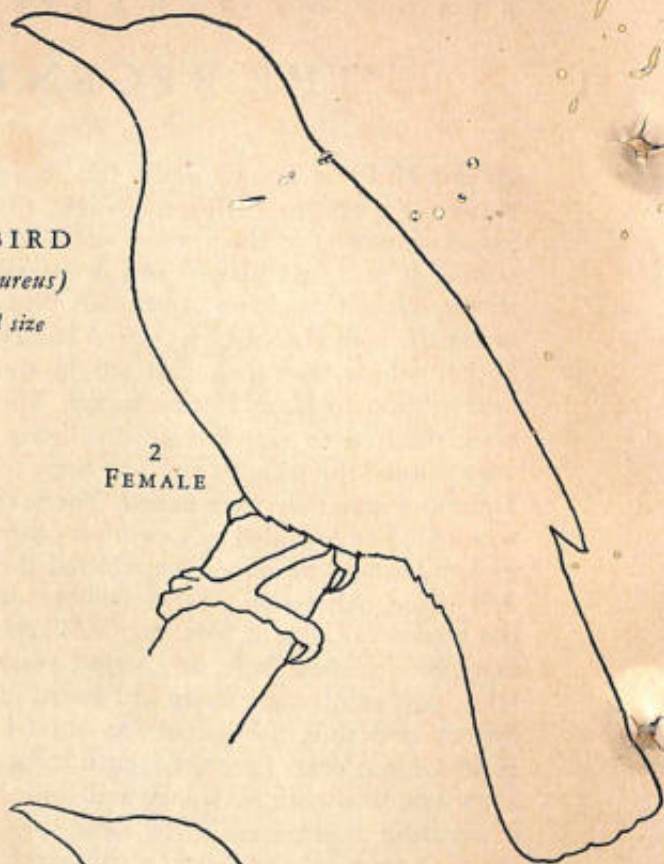
This bird was known under the above name for a century before the origin (as far as is known) of the naming was ascertained. It was first figured and described in the earliest book on Australian birds under the name of Golden-crowned Honey Sucker which was soon changed in the next edition to King Honey Sucker. The book referred to was the one by Lewin, who painted the pictures and sent them to London where they were issued. The text was added or amended by Lewin's brother in London and he may have selected the first name. Although a large number of the books was sent to New South Wales, none ever reached there, and so five years later local prints were made and issued in Sydney and thus the name was altered. Half a dozen years later the French naturalists saw this work in Sydney and copied it, securing a specimen at the same time, but the specimen was lost in a shipwreck, and upon publication said that the bird was known as the Prince-Regent. These Frenchmen were Quoy and Gaimard, and a few years later two other French naturalists, Lesson and Garnot, were also in Sydney and they explained that the celebrated navigator, King, son of Governor King, claimed that the bird had been named after his father, King's Honey Sucker. It may be noted that the well-named King-Parrot of Australia was also first named King's Parrot, but the name has been retained with little alteration. However, apparently the name Regent-Bird had ousted the other by the time Gould came out to Australia, and so it has been called ever since. But why it got the name was always a puzzle. The solution seems to be in Skottowe's MS explanation in the Mitchell Library. Skottowe left a series of paintings which he had proposed to publish, and these came

into the custody of the Library and therein was found an illustration with the title "The Regent," and the text reads: "This charming Bird is given as large as Life, but the colours of the Artist convey but a faint Idea of the Beauty of those with which it has been by Nature adorn'd. They are instead of the Richest Kind, and peculiar to itself alone, its feathering or plumage is also remarkable, nor can the richest Velvet vie with it for texture or elegance of appearance. I am, I believe, the first possessor of any of its kind, and having procur'd the specimen (from which the Drawing here given is taken) on the same day that I receiv'd in this distant part of the World the News of the Regency Restrictions on His Royal Highness the Prince Regent, having been taken off, as a small tribute from the Esteem I bear that exalted Character, I have named it as above." This would thus take place as the first of many birds, here associated, to be named in honour of "exalted Characters," who outlived the noble epithets conveyed at the time of the nomination. The bird now known in Australia as the Regent Honey-eater apparently gained its name at a much later date on account of its similar style of coloration, black and yellow, being recorded by Gould as the "Mock Regent Bird" of the Colonists of New South Wales. The male Regent Bower Bird is a striking looking bird of velvety black with top of head and back of neck golden yellow, with the greater part of the wing feathers brighter yellow, without any ornamental plumage in any way. The female is brownish above, the feathers streaked with whitish, a blackish patch on back of head, and underneath pale brownish, each feather with darker horseshoe markings, with a small blackish spot on centre of throat.

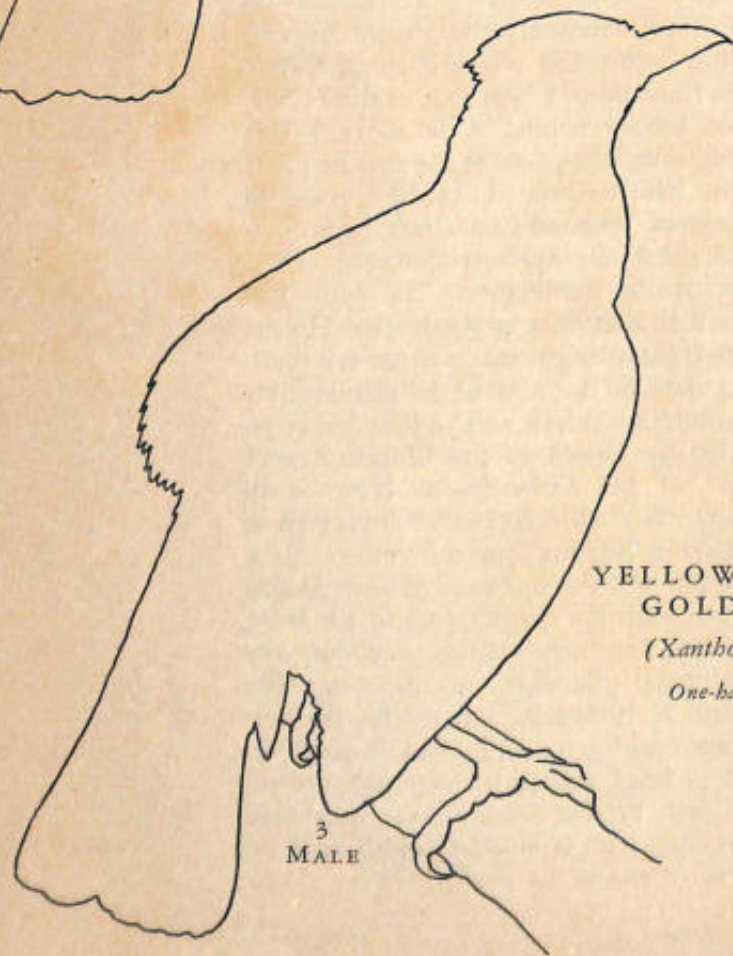


GOLDEN BIRD
(Xanthomelus aureus)
One-half natural size

1
MALE

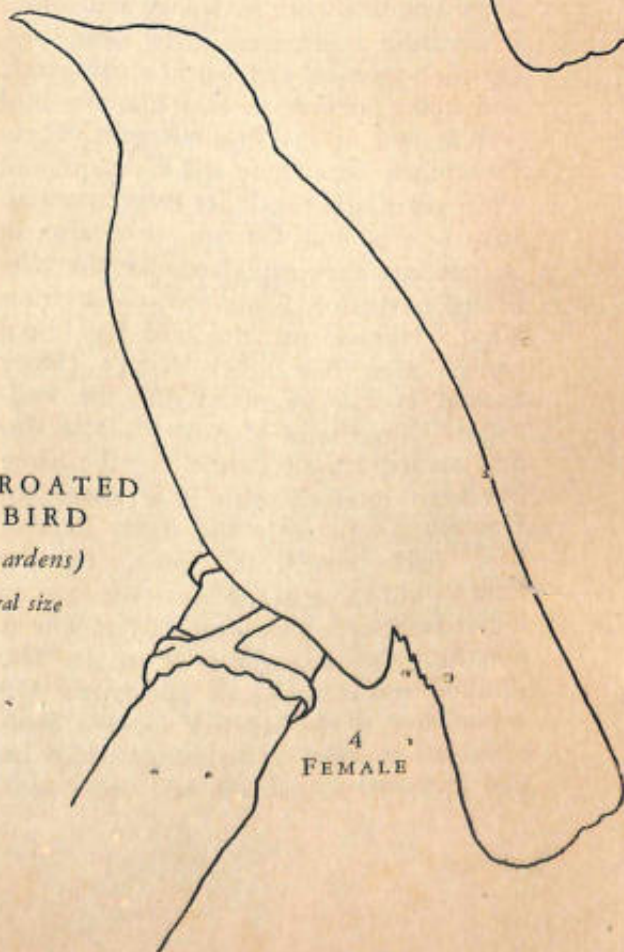


2
FEMALE

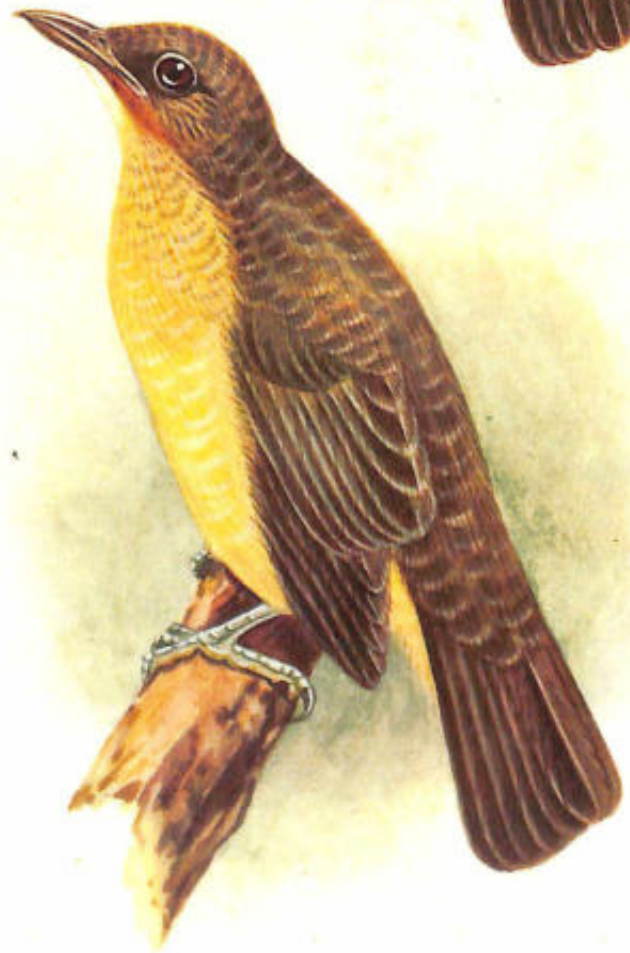


YELLOW-THROATED
GOLDEN BIRD
(Xanthomelus ardens)
One-half natural size

3
MALE



4
FEMALE



Leland H. H. H.

Two Australian naturalists were concerned in the record of the bower building capability of this bird, so unlike the other Australian Bower Birds. C. Coxen, Gould's brother-in-law, got the information from Waller, who saw a male Regent Bird playing on the ground jumping up and down, puffing out its feathers, and rolling about in a very odd manner, which occasioned much surprise, as he had never seen the bird on the ground before. The spot where it was playing was thickly covered with small shrubs, and not wishing to lose the opportunity of procuring a specimen, he fired, but only succeeded in wounding it; and on searching the spot, he found a bower, formed between, and supported by, two small brush plants, and surrounded by small shrubs, so much so, that he had to creep on his hands to get to it. While doing so, the female bird came down from a lofty tree, uttered her peculiar note, and lit on a branch immediately over the bower, apparently with the intention of alighting in front of it, but was scared away by seeing Mr. Waller so close to her. She continued flitting over the place and calling for her mate so long as he was in the neighbourhood. The ground around the bower was clear of leaves for some twelve or eighteen inches, and had the appearance of having been swept, the only objects in its immediate vicinity being a small species of *Helix*. The structure was alike at both ends, but the part designated as the front was more easy of approach, and had the principal decoration, the approach to the back being more closed by scrub."

Ramsay described another bower as "placed upon and supported by a platform of sticks, which, crossing each other in various directions, form a solid foundation upon which the upright twigs are stuck. This platform is about fourteen inches long by ten broad, the upright twigs are some ten or twelve inches high,

and the entrances four inches wide. The middle measures four inches across, and is filled with land shells of five or six species, and several kind of berries of various colours, blue, red and black, which gave it, when fresh, a very pretty appearance. Besides these there were several newly picked leaves and young shoots of a pinkish tint, the whole showing a decided taste for the beautiful on the part of the species."

It may be noted that it is now concluded that this bird only builds bowers occasionally, and some are quite primitive, as if it were only learning the art, and that it might be a possibly recent habit.

The Regent Bird was early separated as a genus *Sericulus* related to Honey-eaters, and judging from structure alone it gives as little clue to its relationships as its colouring does. The bill is unlike that of any other bird in this series. The bill is straight, fairly long, slender, laterally compressed but basally a little expanded, culmen slightly arched, tip a little decurved, posteriorly distinctly notched, nasal groove short, free of feathering, nostril long oval slit in membrane; open, interramal space small, narrow, feathered, gonys long, curved, a little ascending. Wing feathers medium pointed, first primary short, but more than half longest, which is fourth, third and fifth very little shorter and equal, second about equal to seventh, secondaries long, not very broad, rounded, longer than eighth primary, decreasing and narrowing inwards (tertials). Tail square, almost emarginate, medium length, coverts medium, almost half the length of the tail. Legs medium, not very stout, boldly scutellate with seven slanting scutes, bilaminar behind, front toes slender, inner and outer toes sub-equal, with short claw, equalling middle toe alone, hind toe shorter, not very long, claw larger than mid claw, but middle toe and claw longer than hind toe and claw.

The male coloration is black and yellow, top of head and nape bright yellow, the feathers short and crisped, inner primaries, secondaries and tertials yellow, all the rest black; there is a tinge of red on the front of the head, the lores and above the eyes are black, while the first two primaries are black, the remaining ones with black tips and inner webs only. Bill yellow, eye straw, legs and feet black. Bill 25 mm., wing 135 mm., tail 92 mm., tarsus 35 mm. The female is quite unlike in coloration and while the wing may be as long the tail is definitely longer and straight, the two central feathers scarcely any shorter than the others, feathers sharply pointed. While the wing and tail feathers are uniformly brown, all the rest of the plumage is variously marked brown and whitish. The forehead and crown to above the eye is brown speckled with whitish, more white on the forehead, the back of the head, a large squarish patch is black, the nape is speckled black and fawnish white, then a narrow band of black separating this from the back feathers, the upper ones whitish with broad black margins, the margins becoming brown on the lower back, the upper tail coverts uniform brown; the cheeks are

speckled dark brown and fawnish, the chin and upper throat whitish, a black spot on the middle of the throat, the sides and breast whitish with dark brown margin, the margins degenerating into narrow paler brown bands on the abdomen flanks and under tail coverts, the under wing coverts are fawnish tipped with brown, the inner lining a little fawnish. Bill blackish brown, eye brown, legs and feet brown. Bill 23 mm., wing 132 mm., tail 110 mm., tarsus 35 mm.

The young are like the female, and the moult into the male plumage appears to take place irregularly, so that birds mottled and splashed with black are often met with, presenting a peculiar appearance.

Owing to the restricted range there is little chance of subspeciation, although the northern form has been separated on account of its darker orange coloration, but this has not been further investigated. Before its distribution was known Gould named a bird from "Tasmania" as *magnirostris*, but it was found to be merely an aberration, as the bird does not reach Tasmania, at present not going below Sydney in New South Wales.

THE GOLDEN BOWER BIRD

Plate XXVI, Figs. 1 and 2

The very oldest bower-making bird is the bird known as the Golden Bird of Paradise for many years. It has had a chequered career as regards its nomination, as it was at first placed by Linne among the Rollers, then almost at once transferred to the Orioles. Then it was placed among the Birds of Paradise, and now it is commonly regarded as a Bower Bird in the widest sense. In apparent confirmation of this classification Mr. F. Shaw Mayer has given me a note: "When collecting in the Arfak Mts. during August,

1928, I was shown a bower said by the natives to belong to the Golden Bird. It resembled the Bower of the Australian Regent Bower Bird but a little larger. The walls were straight and there were no decorations. It was built under a stand of high bamboos. As we were at about 4,000 feet it was unlikely that it belonged to *Chlamydera* found at lower levels." But no *Chlamydera* has yet been reported from the Arfak Mts., probably Shaw Mayer was remembering the pair he had secured at a bower in the Weyland Mountains. Bec-

cari's notes read: "It was procured by me near Hatam, on the same fig-tree on which D'Albertis obtained the greater number of his birds. It has more or less the habits of a Bird of Paradise, feeding on fruits and particularly on figs. Not more than two or three individuals are found together, generally only a male and a female. It is a very lively and suspicious bird, and after I had killed a male bird, a female, accompanied by another bird (probably a young one), came back after a while to feed on the same tree. Although this bird is found up to an altitude of 3,000 feet or more, it seems to be more abundant on the hills near the sea. In places it frequents there never seems to be more than two pairs. The note, according to my hunters, resembled the zigolio of the Sun-birds, but was much stronger and louder. Only the tuft of plumes of the head is erectile. By the natives of Arfak it is called Komicha." Rand reported this bird from the neighbourhood of Bernhard Camp, on the northern slopes of Mt. Wilhelmina, 850 to 1,200 M (= 2,800-4,000 ft.), two males and two females with wings 140-148 mm. and 138-141 mm., noting "These are the same as Arfak birds. This is the most easterly record of this form."

The genus *Xanthomelus* is easily determined by coloration, but the bill is of medium length, straight, laterally compressed, base expanded, culmen rounded, tip a little depressed, the posterior notch distinct, the nasal groove short, shallow, free of feathering, the nostrils as small open ovals, the interramal space medium,

rounded, gonys a little ascending. The head is subcrested, the mantle apparently erectile, feathers long disintegrating. The wing feathers are pointed, the secondaries broad and rather square tipped, the first primary short, about half the second, the fourth and fifth subequal and longest, the third and sixth little shorter, the secondaries almost reaching these in length; the tail is long, square, tail coverts long, more than half the length of the tail. The legs are strong and boldly scutellate in front, bilaminate behind, toes long, hind toe stouter. The male is vividly coloured black and golden red and orange. The head is subcrested, the feathers full and long, the mantle feathers long and disintegrating, and these are both fiery orange red, probably the mantle feathers are erectile under stress, the throat and face including the eyes and part of the lores are black; rest of under-surface yellow, as all the back to and including the upper tail coverts; the tail is black tipped with yellowish white, the primaries blackish brown, the bases yellow, edge of wing black, upper and lower wing coverts yellow. Bill golden with blackish tip, eyes yellow, legs blue lead. Bill 25 mm., wing 140 mm., tail 80 mm., tarsus 40 mm. The female is modestly covered with olive brown feathers above, the under-surface yellowish, the throat and sides with brownish tips; upper breast with brown bars somewhat angulate. Note the tail is longer. Bill 25 mm., wing 138 mm., tail 95 mm., tarsus 39 mm. The immature is similar to the female, but there is a rufous tinge all over the brown and duller yellow below with juvenile tinge.

THE YELLOW-THROATED GOLDEN BIRD

Plate xxvi, Figs. 3 and 4

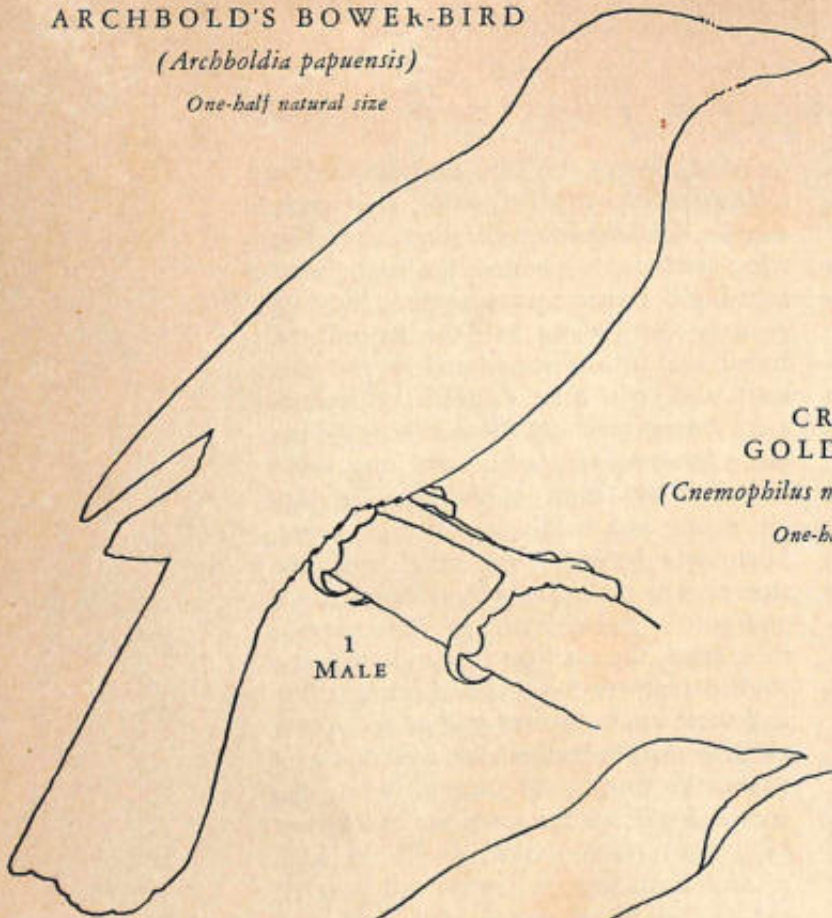
The occurrence of a second kind of Golden Bird was first made known by D'Albertis, who secured a native skin from

the natives in the Fly River district. This was described, and therefore later figured by Sharpe in his Monograph when his

ARCHBOLD'S BOWER-BIRD

(*Archboldia papuensis*)

One-half natural size

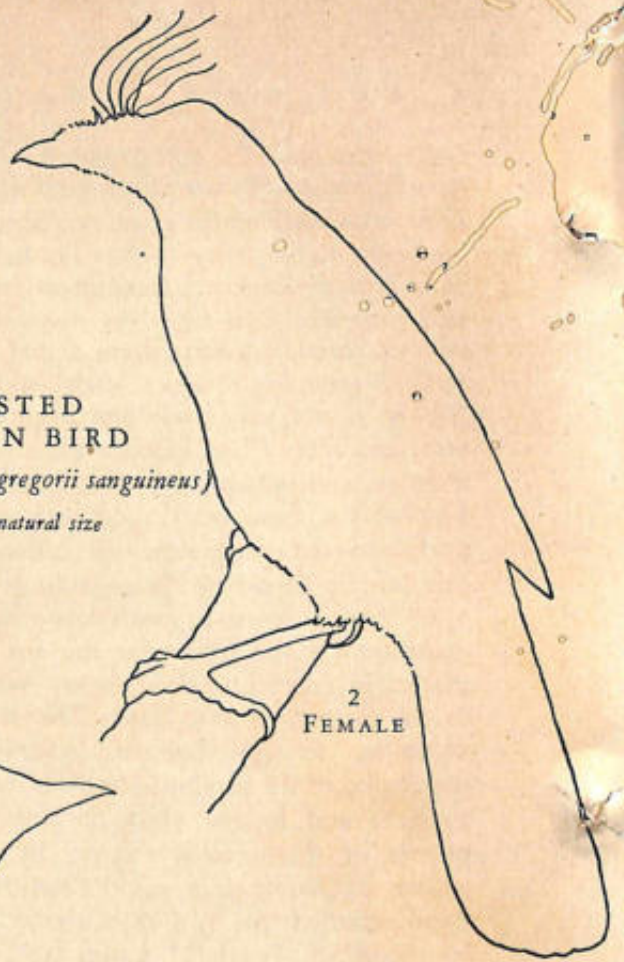


1
MALE

CRESTED
GOLDEN BIRD

(*Cnemophilus macgregorii sanguineus*)

One-half natural size

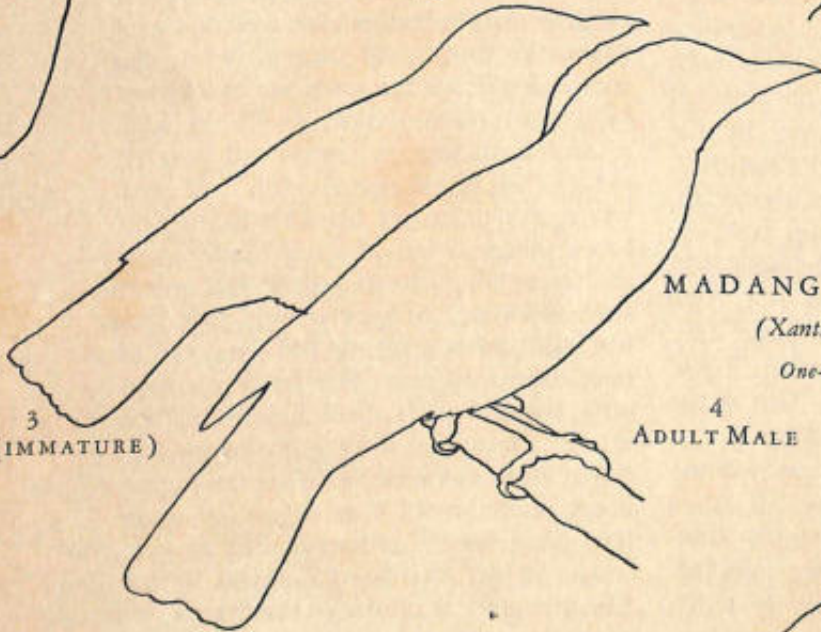


2
FEMALE

MADANG GOLDEN BIRD

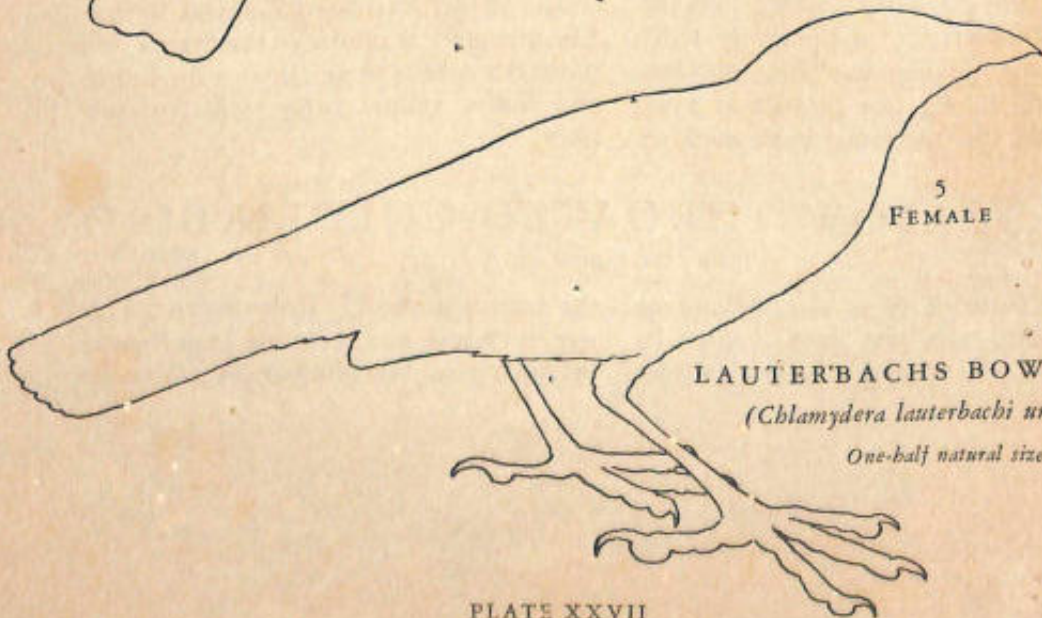
(*Xanthomelus bakeri*)

One-half natural size



3
MALE (IMMATURE)

4
ADULT MALE



5
FEMALE

LAUTERBACHS BOWER BIRD

(*Chlamydera lauterbachii uniformis*)

One-half natural size



Handwritten signature or text, possibly "L. S. G. 1872"

artists, probably at his suggestion, provided an excellent figure, which was accepted without question. Years later a similar bird was received from Sabang, and Van Oort furnished another illustration as it was seen that Sharpe's reconstruction was incorrect. The British Ornithologists' Union Jubilee Expedition secured some specimens from the Wataikwa River district, and Ogilvie-Grant had another coloured illustration made including the previously unfigured female. In the Queensland Museum there is a pair procured at the Endrich River, Dutch New Guinea, by Thomas Jackson on Sept. 14/21, 1923, and Captain N. B. Blood secured a complete skin from the natives in the Mount Hagen district. This is the figured and described bird hereafter.

Obviously nothing is known of its habits, so that only the descriptions can be given. Van Oort wrote: "Head, neck and mantle fiery orange-red; feathers of the mantle elongated, but somewhat shorter than in *X. aurea*; back, rump, wing coverts and secondaries orange-yellow, the latter tipped with black; upper tail coverts black, tipped with yellow; tail black; primaries black, yellow at the base; bend of wing and under wing coverts rich yellow; bastard-wing black; chin, throat and breast golden yellow, some feathers of the foreneck and of the chin with fiery red tinge; lores, sides of face and ear coverts fiery orange red; feathers above and behind the eye tinged with violet; feathers of the side of the neck fiery orange-red and elongated, forming with the elongated feathers of the mantle a collar; vent and under tail coverts golden yellow; feathers of thighs blackish with yellow tips. Wing 135-141 mm., tail 76-78 mm., bill 22-23 mm., tarso-met. 44 mm. Two males in full dress and also an ornamental native skin, to which are wanting only the legs and the lower mandible; the throat in the latter has a strange

orange tinge. The tail has a length of 68 mm."

Ogilvie-Grant recorded a series of seven, including three adult males, three males, and one adult female, describing the latter: "has the upper parts, including the top and sides of the head, brown tinged with olive, the throat whitish and the under parts pale yellow, the feathers of the chest margined with brownish. The wings are brown like the back; the shafts and inner webs of the quills viewed from below are bright yellow. Wing 135 mm. . . . A young male, apparently in second plumage, resembles the adult female, but the chest feathers are brownish, not yellow edged with brown; and among the feathers of the mantle there are a few orange-red plumes, making their appearance and probably heralding the third plumage."

Ogilvie-Grant also pointed out the distinction between this and the Arfak Mts. bird: "The latter has a much stouter bill; the cheeks, chin and throat black, the mantle more orange; the lesser wing coverts black, and the inner secondaries devoid of black tips, only the first five being rather narrowly marked with black at the extremity."

The Queensland Museum birds agree closely with the above, as would be expected coming from the same area.

The Mt. Hagen bird is here described: Head, neck and upper back feathers, lengthened on latter and a little disintegrated and spreading on the sides of the neck in the form of a cape probably erectile, vivid vermilion, the bases yellow, above and around eye a dark crimson patch, lower back yellow with a tinge of orange, rump lemon yellow, upper tail coverts blackish brown with yellow tips disintegrating, tail blackish brown; wing coverts orange, bend of wing chrome yellow, primaries blackish brown with orange

bases, the orange extending inwards so that secondaries are orange with brown tips only; under wing coverts, axillaries and inner wing lining as in all the under-

surface save chin and throat, the former yellowish but the latter crimson; thighs brown with yellow tips. Bill 24 mm., wing 140 mm., tail 80 mm., tarsus 44 mm.

THE MADANG GOLDEN BIRD

Plate XXVII, Figs. 3 and 4

One of the most surprising discoveries in recent times was that made by the famous collector of sea birds, Rollo Beck. After years collecting on the Pacific Ocean he was sent on his way home, as a business holiday change, to New Guinea to get some Birds of Paradise. Having no knowledge whatever of this kind of bird he was probably more astonished than his colleagues when he was told that among his spoils was an entirely new Golden Bird. This would have been surprising had he been exploring the wilds of New Guinea, whereas he had been merely collecting around Madang, one of the headquarters of plume collectors in the bad old days. Indeed it was early reported that the pioneers of European settlement in that district had killed off all the Birds of Paradise to secure easy money.

The new bird was comparatively described as "Related to the Golden Bower Bird, but with short crown feathering of scarlet colour, wholly black under parts, and black upper wing coverts in the adult male plumage. The yellow area on the wing-quills is reduced to approximately the same size as in the Regent Bower Bird, but it extends to the outer webs of the bases of most of the primaries. On the other hand, the long cape of hair-like feathers overlying the upper back is very well developed, the tail is square, and the bill is stout."

Nothing is known of its habits and the detailed description is here given: "Adult male. Whole under parts black, with a faint bluish sheen on throat and chest, but becoming duller and more brownish

black on abdomen. Under tail coverts dull black, narrowly margined with olive-yellowish. From the throat the black area extends, up over cheeks and ear coverts to enclose the eye, so that there is a complete narrow band of black above the eye connecting with the black loreal area, from which a narrow black border extends up behind the nostril to the base of the culmen. Remainder of forehead and crown deep scarlet red with a pronounced silky sheen, and varied over the whole middle of the crown with black. The crown feathers are only about 8 mm. long, mostly black, with only scaly tips of a scarlet red. Nape cadmium orange, washed with scarlet, especially behind the temporal region, this coloration continuing to the long decomposed feathers of the "cape," which arise from the hind neck and conceal the plumage of the whole upper back. The longest feathers of this cape reach a length of 56 mm. The lateral margins of the cape are most strongly tinged with flame scarlet or grenadine red. Scapulars, back, rump and upper tail coverts deep black, with very faint gloss. Tail square; the rectrices black, slightly brownish as seen from below. Wing rounded, the 10th (outermost) primary 60 mm. long and 7th primary (4th from outer side) longest, nearly equalled by 6th. Alula and all upper wing coverts, including primary coverts, uniform black. Primaries black with light cadmium yellow bases, the yellow area extending to the outer web on all but the outermost (10th) primary. The outer web of the innermost primary is yellow for a distance of 65 mm. from its

base. The outermost secondary is yellow for about two-thirds of its length, with the distal third black. The black tips of the secondaries become gradually restricted on the proximal secondaries until the cadmium yellow on the outer web extends to within 12 mm. of the tip. Then the yellow becomes limited to the outer web, and the innermost secondaries are again entirely black. The under wing coverts are black, except that the greater primary coverts are yellow (outer ones tipped with blackish) and the longest under secondary coverts are yellow, the next row black in middle, but broadly margined with light yellow. Wing 137 mm., tail 82 mm., exposed culmen 22 mm., culmen to base 25 mm., depth of bill at nostril 10 mm., tarsus 43 mm. The colours of the eye and naked parts are not noted on the label; but the bill in the dried skin is blackish, shading at its base to light brownish; the feet are blackish with pads beneath the toes light grey-brown.

Immature male. General colour above raw umber, slightly lighter on crown and hind neck, but much paler on anterior part of forehead, lores and region about

eye. The "cape" is faintly indicated by narrowing and very slight lengthening of feathers on hind neck. Greater and middle upper wing coverts have lighter, greyer margins, and the outer webs of remiges are tinged with orange-citrine. Inner webs of most of the remiges are light cadmium yellow, but this yellow colour is limited to the basal part of the outer primaries, and there is no sharply limited, yellow area as in adult male. Under wing coverts dull yellowish, some of them with a little dusky mottling. Tail feathers olive brown like back but distinctly washed with greenish below, and shafts dull yellowish beneath. Cheeks and ear coverts dull buff, the feathers with faint dusky margins and the colour deepening to rufous buff on the longer ear coverts. Chin and throat whitish buff; feathers of fore neck with faint dusky tips. Breast and flanks pale cream buff with irregular bars or lunulate marks of blackish brown. Abdomen clear yellowish cream colour, and under tail coverts similar but with a few narrow, wavy bars of dusky brown. Wing 134 mm., tail 78 mm., exposed culmen 21 mm., tarsus 43 mm."

THE CRESTED GOLDEN BIRD

Plates xxvii, Fig. 2; xxviii, Figs. 1, 2 and 3

One of the best discoveries made when Macgregor stormed the Owen Stanley heights was the Crested Golden Bird, fittingly scientifically named after the great leader of the Australian annexation of Southern Eastern New Guinea. It is unknown whether Macgregor had been interested in natural history before his appointment to New Guinea, but certainly he showed a great deal of interest when travelling, allowing every opportunity, and even making his naturalist assistants revisit places that had appeared profitable in their early rush-surveys. The Crested

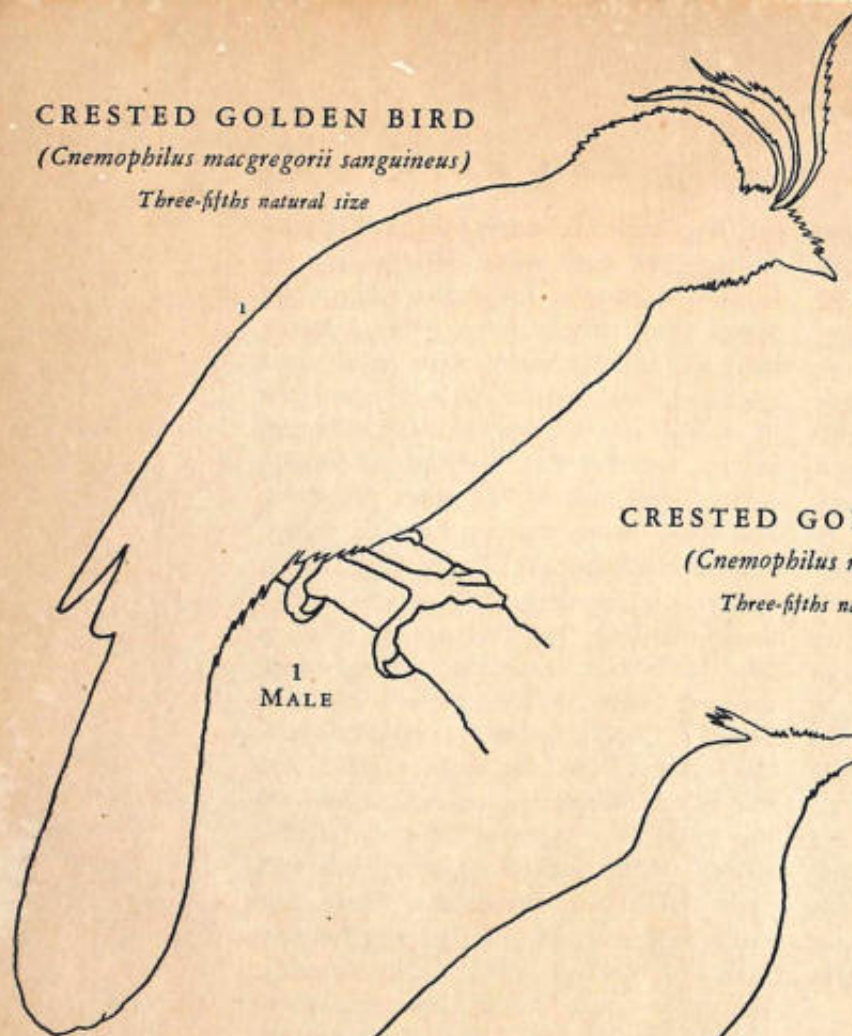
Golden Bird was first secured at an altitude of 11,000 feet on Mount Knutsford and later on the Wharton Range at about 10,000 feet.

Although at first sight it recalls the Golden Bird and is here placed next, it may not be closely related, the quaint head crest being very peculiar, while the tail is differently formed and the bill structure seems to differ essentially. The bill recalls that of Newton's Bower Bird rather than that of the Golden Bird, being short and stout, and the nostrils hidden by the thrust forward feathering so unlike the bare bill

CRESTED GOLDEN BIRD

(*Cnemophilus macgregorii sanguineus*)

Three-fifths natural size



CRESTED GOLDEN BIRD

(*Cnemophilus macgregorii*)

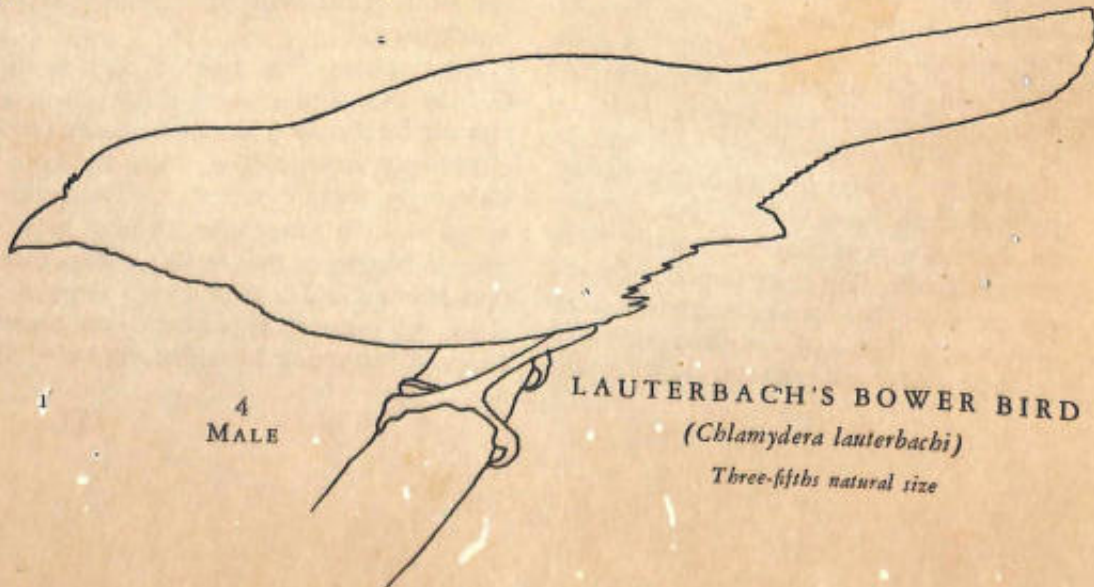
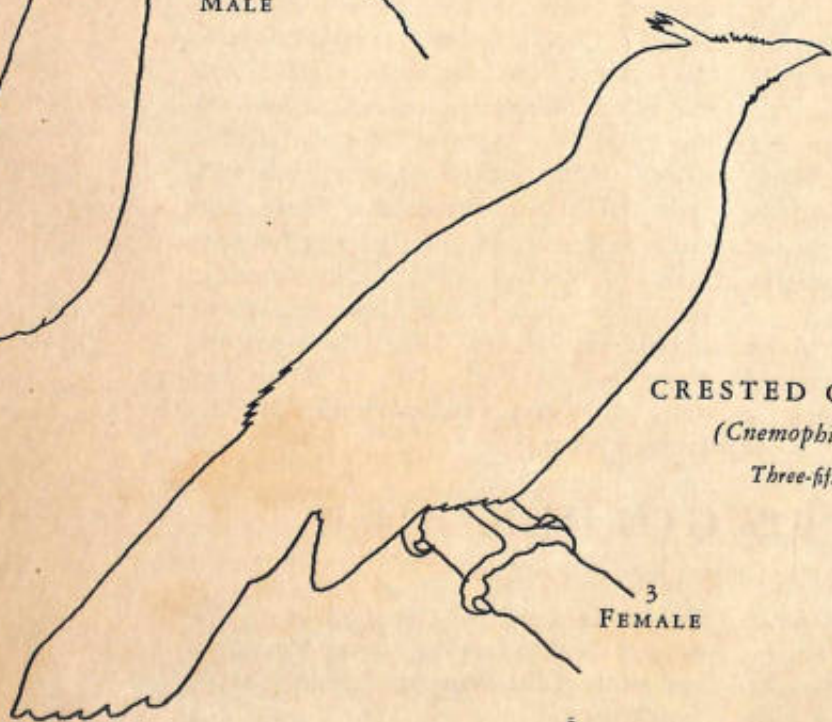
Three-fifths natural size



CRESTED GOLDEN BIRD

(*Cnemophilus macgregorii*)

Three-fifths natural size



LAUTERBACH'S BOWER BIRD

(*Cblamydera lauterbachii*)

Three-fifths natural size



of the latter; the wing formation is also very unlike, as the secondaries are much more normal and the tail is long and wedge-shaped instead of being short and square; the legs are also different, as these are slenderer and smooth and the toes of different proportions. But the presence of the curious crest is abnormal, as the six feathers forming it are curved and boat-shaped, fitting into one another and then snugly fitting it into a medial depression of the feathers of the crown when they are laid down. The female is also unlike that of the Golden Bird, being similar in form to the male even to the development of the crest, only lacking the bright coloration. Apparently it does not form a noticeable bower, as no one has yet recorded anything of this nature in connection with the bird.

With regard to the discovery of this bird, one of the members of the Expedition, Goodwin, wrote an account and sent it to *The Ibis*, anticipating the official account, but fortunately for once the latter appeared just a little earlier, but Goodwin's remarks are of interest, and he wrote thus: "The only new Bird of Paradise discovered during the expedition was a bird very similar to the Golden Bird of Paradise (*Xanthomelus aureus*), and I have no doubt it will prove to be a species of this genus when the specimen comes to be examined. It was met with on ascending Mount Owen Stanley. I therefore propose to name it *Xanthomelus macgregori*, in honour of our leader. It is of the same size as its prototype, with head, back and wings of a golden orange, but the breast and abdomen are black. The feathers on the head are parted in the middle and form a small crest in front; the beak and feet are similar to those of *X. aureus*. The tail in the single specimen obtained had been shot away."

The American Archbold Expedition reported: "At both Murray Pass and Mt.

Tafa 2,400 M (8,000 feet) this bird was fairly common. It was a rather shy bird of the lower part of the forest, often found in the tangled ground cover where even the male with its striking inverted colour pattern was difficult to see. It fed on the small fruits of shrubs and low second-story trees of the forest, and when feeding could sometimes be closely approached. Macgregor's bower bird has a variety of calls, a low, harsh, hissing call, a loud clicking call repeated a number of times and a loud call that I can only describe as being similar to the sound of two timbers being rubbed together under considerable stress. This last call was startling in quality, and its author was long a puzzle to me."

It may be noted that although "this bird was fairly common" there is no mention whatever of any bowers being seen or of any activity in this direction, and neither did Guilianetti, who found them on the Wharton Range, report anything of this kind.

When De Vis introduced the genus *Cnemophilus* he referred it to the family *Ptilonorhynchidae*, stating: "The systematic place of the genus seems to be between *Amblyornis* and *Xanthomelus*," and no one since seems to have made any further attempt at its classification, perhaps on account of its extreme rarity. De Vis wrote: "Bill shorter than the head, broader than high; culmen rounded, curved towards the tip; nostril basal, oval, almost concealed by elongated nasal plumes directed forwards; basal profile of mandible straight. Wing short, rounded, reaching to the tarsus; primaries longer than secondaries by half the length of the hallux without claw, first primary two-thirds of the second in length; tip of wing formed by the 4th, 5th, 6th and 7th quills. Tarsus moderate in length, stout, scutellation entire fore and aft. Feet strong,

hallux equalling the mid toe without claw; laterals unequal."

To these details may be added: Bill rather stout for length, tip a little decurved, sharp, notched posteriorly; nasal groove rather long, nostrils oval placed in fore end of groove, remainder of groove concealed by approaching feathering; bill subtriangular, the culmen flatly rounded; interramal space broad, long, triangular, feathered, gonys rounded a little curved ascending; no rictal nor nasal bristles present. Wing feathers medium, not much pointed, secondaries not very broad, ends rounded. The tail had been shot away in the first specimen (according to Goodwin) and is not mentioned above. It is of medium length, feathers rather narrow and with rounded ends, and is regularly wedge-shaped, the outer feathers three-quarters the length of the middle ones, which are longest. The claws are long, slender, hind claw a little longer and stouter, but the hind toe is definitely shorter than the middle toe. The coloration of the male is "golden yellow, somewhat silky in appearance on head, neck and upper back, the lower back becoming brownish yellow, as are also the rump and upper tail coverts. Wings and tail cinnamon brown. All the lower surface black extending upwards to above the eye and on to the nasal groove. The crest is blackish chestnut at the base, but becoming brighter to deep orange at the tip. Bill dark brown with paler tip, eye brown, legs and feet dark brown grey. The female has all the upper-surface deep bright red brown with a greenish shimmer, primaries and tail feathers lacking the green tinge, tail feathers broad with a hair tip, under-surface green on throat, darker green on breast tinged with red, paler on the abdomen, less greenish and more reddish; flanks and under tail coverts dark green, under wing coverts pale rufous brown, inner wing lining paler salmon. Bill 12

mm., wing 94 mm., tail 96 mm., tarsus 39 mm. A small ferruginous brown crest similar to that of the male generally present. The young male is like the female."

A series collected by Captain N. B. Blood in the Mt. Hagen district represents a new species or subspecies which is called *C. m. sanguineus* according to the views of the worker. The male has the head bright vermilion instead of golden yellow, and the neck and upper back continue the same colour, which even runs down with very slight paling to the upper tail coverts, the wings and tail deeper brown cinnamon, the tail much deeper with a reddish tone; the under-surface black has a bronze shimmer; the crest feathers are six in number, 30 mm. long, reddish brown with a golden shimmer. Bill tip 13 mm., wing 113 mm., tail 95 mm., tarsus 39 mm. This was secured at Kumdi, Mt. Hagen area, and another at Moyani 8,000 ft. Two females were procured at Lake Iviva in the same area at 7,850 feet. The older one has the crest of six feathers as fully developed as in the male and measures, bill tip 12 mm., wing 112 mm., tail 105 mm., tarsus 40 mm. The upper-surface is deep olive green with only a very slight rufous sheen on the upper tail coverts, the tail darker with a slight reddish tinge on the edges, primaries dark brown with rufous edging; tail feathers narrowish with round tips; the head feathers with dark tips giving a scalloped appearance, while the throat is olive green uniform, the breast olive with paler shaft stripes, abdomen paler with yellowish tinge medially, little or no red tinge present anywhere, under wing coverts brown, inner wing lining scarcely noticeably paler. A younger female shows the six crest feathers only 10 mm. long and the colour as above, with scarcely any difference above but with the under parts, as to the breast and abdomen, notably paler, the latter with a yellowish tinge.

GARDENERS

Subfamily *Amblyornithinae*

Plates XXIX and XXX

WHEN Gould brought the news to England that birds in Australia built playgrounds which he called Bowers and hence the birds Bower Birds, it caused such a sensation that it was widely quoted, even appearing in a book entitled *Scenes and Tales of Country Life* (in England)!

Perhaps even a greater sensation was created when the Italian explorer, Dr. Beccari, published an account of an even greater achievement by a New Guinea bird in an Italian scientific journal. This playground was likened to a garden and the bird a gardener, so that it was meet, though surprising, that the translation into English should appear in the "Gardener's Chronicle", from which it has been quoted ever since by English writers. "The *Amblyornis inornata*, or, as I propose to name, the Bird gardener, is a Bird of Paradise of the dimensions of a Turtle Dove. The specific name *inornata* well suggests its very simple dress. It has none of the ornaments common to members of its family, its feathers being of several shades of brown, and showing no sexual differences. It was shot some years ago by the hunters of Mynheer von Rosenberg. The first descriptions of its powers of building (the constructions were called 'nests') were given by the hunters of Mynheer Bruijn. They endeavoured to bring one of the nests to Ternate; but it was found impossible to do this, both by reason of its great size and the difficulty of transporting it. I have fortunately been able to examine these constructions in the remote places where they are erected. We were on a projecting spur of Mount Arfak. The virgin forest was very beautiful. Scarcely a ray of sunshine penetrated the branches. The

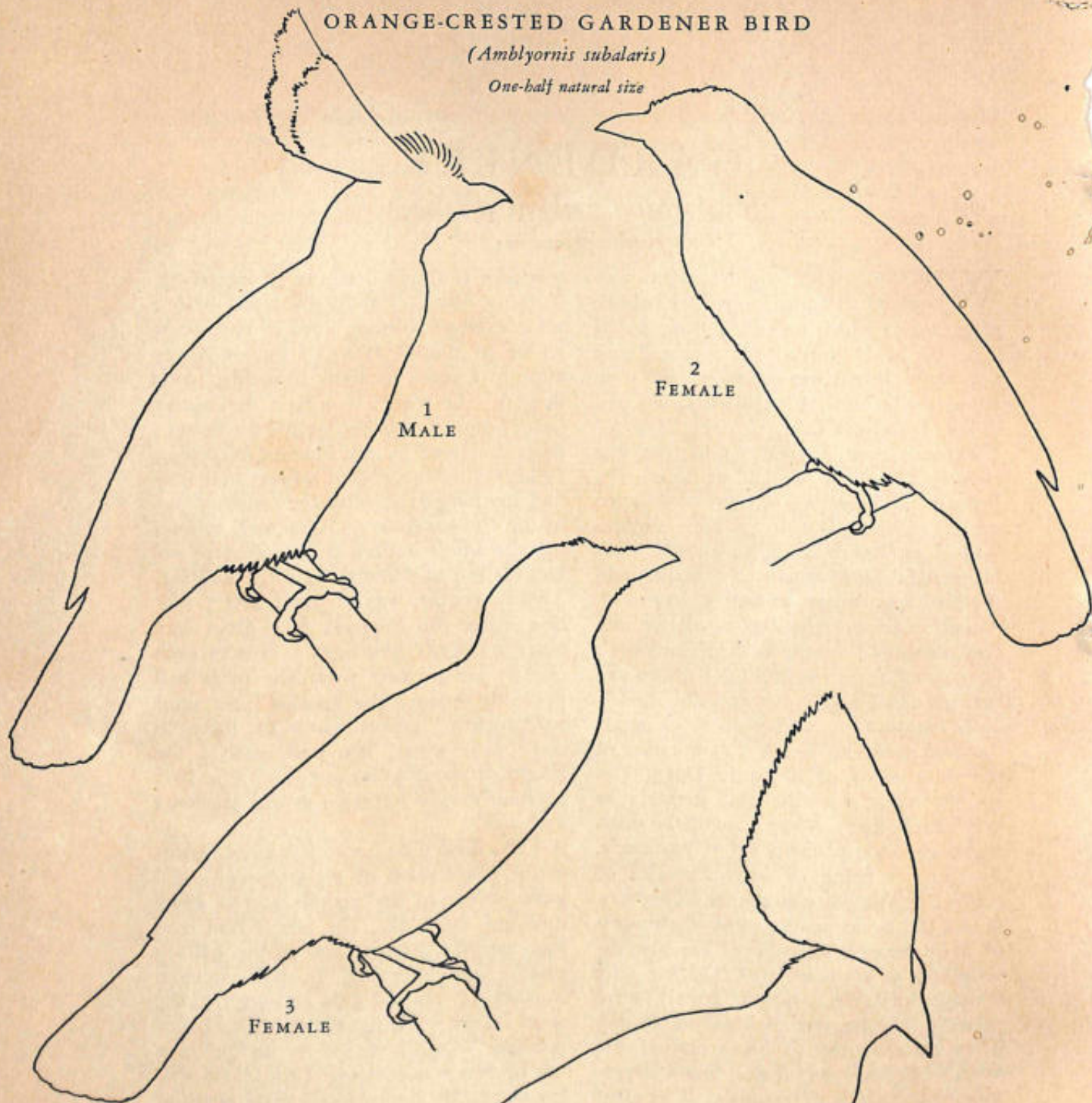
ground was almost destitute of vegetation. Turning round, I suddenly stood before a most remarkable specimen of the industry of an animal. It was a hut or bower close to a small meadow enamelled with flowers. The whole was on a diminutive scale. I immediately recognised the famous nests described by the hunters of Bruijn. I did not, however, then suspect that they had anything to do with the constructions of the *Chlamydoderae*. After well observing the whole I gave strict orders to my hunters not to destroy the little building. That, however, was an unnecessary caution, since the Papuans take great care never to disturb these nests or bowers, even if they are in their way. The birds had evidently enjoyed the greatest quiet until we happened, unfortunately for them, to come near them. We had reached the height of about 4,800 feet; and after half an hour's walk we were at our journey's end.

"The Nest. I had now full employment in the preparation of my treasure; and I gave orders to my people not to shoot many of the birds. The nest I had seen first was the nearest one to my halting place. One morning I took colours, brushes, pencils and gun, and went to the spot. I there made the sketch which I now publish. While I was there neither host nor hostess was at home. I could not wait for them. My hunters saw them entering and going out, when they watched their movements to shoot them. I could not ascertain whether this bower was occupied by one pair or by several pairs of birds, or whether the sexes were in equal or unequal numbers—whether the male alone was the builder or whether the wife

ORANGE-CRESTED GARDENER BIRD

(*Amblyornis subalaris*)

One-half natural size



1
MALE

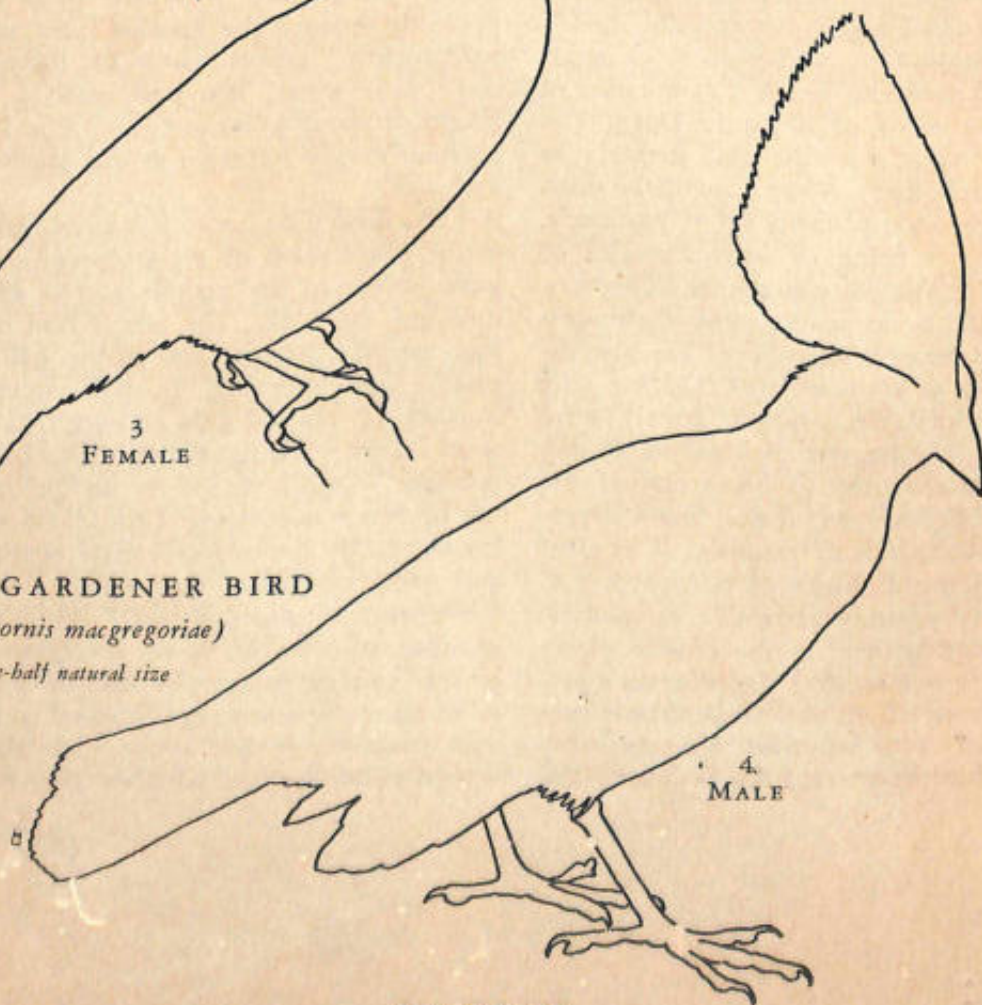
2
FEMALE

3
FEMALE

CRESTED GARDENER BIRD

(*Amblyornis macgregoriae*)

One-half natural size



4
MALE



Lilinal Meolau

assisted in the construction. I believe, however, that such a nest lasts for several seasons.

The *Amblyornis* selects a flat even place around the trunk of a small tree that is as thick and as high as a walking-stick of middle size. It begins by constructing at the base of the tree a kind of cone, chiefly of moss, of the size of a man's hand. The trunk of the tree becomes the central pillar; another whole building is supported by it. On the top of the central pillar twigs are then methodically placed in a radiating manner, resting on the ground, leaving an aperture for the entrance. Thus is obtained a conical and very regular hut. When the work is complete many other branches are placed transversely in various ways, to make the whole quite firm and impermeable. The whole is nearly three feet in diameter. All the stems used by the *Amblyornis* are the thin stems of an orchid (*Dendrobium*), an epiphyte forming large tufts on the mossy branches of great trees, easily bent like straw, and generally about twenty inches long. The stalks had the leaves, which are small and straight, still fresh and living on them—which leads me to conclude that this plant was selected by the bird to prevent rotting and mould in the building, since it keeps alive for a long time.

"The refined sense of the bird is not satisfied with building a hut. It is wonderful to find that it has the same ideas as a man; that is to say, what pleases the one gratifies the other. The passion for flowers and gardens is a sign of good taste and refinement. I discovered, however, that the inhabitants of Arfak did not follow the example of the *Amblyornis*. Their houses are quite inaccessible from dirt.

"The Garden. Now let me describe the garden of the *Amblyornis*. Before the cottage there is a meadow of moss. This is brought to the spot and kept free from grass, stones, or anything which would

offend the eye. On this green flowers and fruits of pretty colour are placed so as to form an elegant little garden. The greater part of the decoration is collected round the entrance to the nest; and it would appear that the husband offers there his daily gifts to his wife. The objects are very various, but always of vivid colour. There were some fruits of a *Garcinia* like a small-sized apple. Others were the fruits of *Gardenias* of a deep yellow colour in the interior. I also saw small rosy fruits, probably of a Scitamineous plant, and beautiful rosy flowers of a splendid new *Vaccinium* (*Agapetes amblyornithis*). There were also fungi and mottled insects placed on the turf. As soon as the objects are faded they are moved to the back of the hut. It is a clever bird, called by the inhabitants 'Buruk Gurea' (master bird) since it imitates the songs and screamings of numerous birds; also 'Tukan Kobon' which means a gardener."

The Gardener Bower Bird discovered was crestless and remained the only species in its genus until the Macgregor Expeditions showed that two crested forms lived in the south-eastern Mountain heights. One had been described before from a crestless female, but no crested males were known from the north-west mountains. However, that did not deter the subspecies enthusiasts, and they classed the eastern crested bird as a subspecies of the western, hoping that crested birds would be found in the west. Such were later found, thus apparently confirming their action, but it was still later discovered that the crested and uncrested birds of the west were not the same bird. So now the original Gardener stands alone as the only uncrested bird with a very restricted range in the Mountains of the Arfak Peninsula as far south as the Wandammen Mountains.

This is such a plain-looking bird that it was distinguished generically by inac-

curate data, the feathering of the nasal groove and the ten feathers of the tail. The feathering was not of much importance and the tail was found to have twelve feathers, but the genus was upheld by the stoutness of the bill, the frontal leg covering, just as futile criteria by their own valuation. When the crested forms were discovered, this was an excellent justification, but again when the uncrested form was established, a generic name was proposed for the crested ones. At present these are again united and further data are necessary to work out the evolution of the crested and uncrested forms.

The bill is short, stout, deep, laterally compressed anteriorly, culmen rounded, basally expanded, wider than deep, nasal groove long, nearly half length of bill, but feathers approaching and concealing small oval nostrils; culmen well arched, tip a little decurved, sharp, posterior notch distinct; interramal space feathered, rounded, gonys medium, curved, ascending. Head uncrested or bearing a very long full crest which is erectile into a large pompom. The wing feathers are of medium width, pointed, the first rather long, more than half the longest, which may be the fourth or fifth, the third and sixth very slightly

shorter, the seventh less than the second and longer than the secondaries which are only of medium width but with rounded ends. The tail long and square, the feathers again of medium width, the tail coverts long, about half the length of the tail. The legs medium, not very stout, the outer smooth, the back bilaminate; the front toes long and thin, the outer and inner toes almost equal, the inner toe and claw only equalling the middle toe alone, claws medium; the hind toe short and the claw short so that the hind toe and claw are much shorter than the middle toe and claw.

It is here suggested that these Gardeners are very close to some of the birds classed as *Pitohui*, of which one, *cristatus*, can be mistaken for one, the differences in structure being slight.

The coloration of the Gardener above is brown with a reddish tinge, underneath orange brown, paler on the centre of the abdomen, darker on the sides, chin paler, under wing coverts orange buff, inner wing lining pale brown. Bill black, eye chestnut, legs lead grey. Bill from nostril 16 mm., wing 128 mm., tail 88 mm., tarsus 35 mm. Female is similar, perhaps a little smaller.

THE YELLOW-FRONTED GARDENER.

Plate xxx, Fig. 3

This apparently very distinct Gardener was described from Dutch New Guinea, and the exact locality has not yet been discovered. It differs in the fact that the bright coloration of the crest begins at the base of the bill, whereas in the other species it starts midway on the crown. It has also been recorded that the feathers are very long and slender, but with united webs like an ordinary feather, while in all the other species the webs are disintegrated and the complete feather appear-

ance is missing. Further the under-surface differs as hereafter described; general colour above dark brown, a little more rufescent on the lower back and rump, wing coverts like the back; quills and tail dusky brown, externally washed with olive; crown of head from the base of the forehead bright orange-yellow, including the enormous crest; the shafts of the crest feathers lemon yellow towards the base; lores and sides of crown dark sooty brown; as well as the sides of the face and throat,

shading off into lighter brown on the fore-neck and chest; remainder of under-surface of the body light cinnamon brown; axillaries cinnamon; under wing coverts

pale cinnamon; quills dusky below, yellowish along the inner web. Total length 204 mm., culmen 23 mm., wing 132 mm., tail 83 mm., tarsus 33 mm.

THE CRESTED GARDENER

Plate XXIX, Figs. 3 and 4

The first crested Gardener Bird was discovered in the coastal mountains of south-eastern New Guinea, but when the indomitable Macgregor essayed the exploration of the high mountains more inland he engaged naturalists to accompany the expedition. His faith was rewarded by brilliant discoveries of new bird forms, and not the least important was the recognition of a second species of Crested Gardener, a larger bird than the first found, and with a longer, more brilliant crest. The smaller bird had been easily separated from the original Arfak bird, not only by its crest as the female had been named first, but by its streaked under-surface and inner wing lining. However, this larger bird was similar on the under-surface and of the same size, with less differentiation in the colour of the wing lining, so doubt arose as to whether the birds from Arfak could be all females and that the male might be crested. This supposition became an obsession, and when a Crested form was found in the west, it was greeted as the missing male. It took years to remedy the error and show that the crested and uncrested were quite distinct. So now all the yellowish crested birds are placed together, perhaps again erroneously. However, as in the former case, time will show. The general appearance of this bird is olive brown above and below, the under-surface not streaked and the wing lining pale yellowish, the male bearing a large full crest of disintegrating feathers of pale yellow to orange yellow, the sides olive, forehead olive, and tips spotted or edged

with olive. The female is similarly coloured but slightly smaller, but larger than the orange red crested bird and slightly larger even than the uncrested form. Owing to the large range given to this bird no exact definition can yet be given as the birds show variation and subspecies have been named.

Goodwin, who accompanied Macgregor's first expedition into the Owen Stanley Range, seems to have been an accurate observer, interested in ornithology, and his notes are worth transcribing: "The Birds of Paradise are usually divided into three groups . . . the third group consists of the Bower Birds, the most interesting of which that we have met with was one of the genus *Amblyornis*, also a new bird to science. As it was found on Mount Musgrave, I propose to call it *Amblyornis musgravianus*. It is somewhat larger than *A. subalaris*, and measures about 10 inches from the tip of the beak to the end of the tail; the wings and back are of a dull darkish green; the throat, breast and belly of a uniform brown; under the wings of a yellowish brown. The crest is of a deep golden orange, slightly streaked with darkish brown, and the centre feathers tipped with the same colour. The iris is brown, the base of the beak horn colour, and the feet are black. Like the rest of the Bower-birds, it is of a shy disposition, and it requires great patience and prudence to obtain specimens. It is keen sighted and quick of motion; its notes, of which there are several, are clear and sharp. I had never seen a more beautiful bower or

playground than that which it constructs. The first bower of *A. musgravianus* met with was constructed of moss. It was about two feet high, and built evenly round a small tree, looking at first sight like a marble fountain. The small sticks placed in various positions on the tree gave the idea of jets of water. The outer rim of the playground was about three inches higher than the inside course, which was smooth and even." By chance the official account by De Vis was published first and this new bird was named *A. macgregoriae* and fully described, followed by a long account: "Nothing in the history of the bower birds, so far as we know it, is of greater interest than the specific modifications developed in that strange instinct whence they derive their popular name. From its rudimentary indications in *Scenopaeus*, which merely deposits and rearranges a few leaves or twigs on the bared ground, to the elaborate structure of *Amblyornis inornata*, continuous steps of progress in the art of bower building are recognisable. The general plan of these highly artificial constructions, their deviations from it, their materials and garniture, the methods of work adopted by the birds, their sexual shares in the labour, and the comparative permanence of its results—all these are well worth the investigation of the field naturalist; still more so the development of the instinct considered as a psychical manifestation. The bower of *A. macgregoriae* departs widely from the ordinary plan of a more or less completely roofed gallery or tunnel through which the birds run to and fro. Around a young tree growing on the slope of a bank or ridge a circular mass of sticks intermingled with moss, and forty-five inches in diameter is built with perpendicular sides to a height varying from nine inches to two feet, the moss being used so copiously that externally it alone is visible. On the upper-surface a

circular channel nine inches in depth is left between the tree and the outer edge of the pile. The outer wall of the channel is nine inches in breadth; so also is its inner wall or the raised boss from the centre of which the tree protrudes. All round the tree itself to a considerable height above the platform are fixed short sticks, interlaced at one end, protruding at the other, as though to form a protection against the approach of an enemy from above. The depressed channel of the upper-surface is the playground of the bird; in it several individuals of both sexes may be seen pursuing each other round and round. Mr. Kowald, who saw one of these bowers being built, states that all the materials are selected and conveyed by the males to the females who alone are the architects. Mr. Kowald is strongly of opinion that the increase of the bower in height is almost constantly in progress, and that each is used by the same birds for years in succession."

The typical bird has the upper-surface olive brown, slight reddish tinge on the forehead and cheeks, the lower-surface paler uniform from throat to tail coverts; under wing coverts pale brownish yellow, inner wing lining dull yellowish, crest long, orange yellow, frontal feathers, sides and tips olive brown. Bill blackish brown, pale below; eye brown; legs black. Bill 20 mm., wing 145 mm., tail 93 mm., tarsus 35 mm. The female is more reddish above and below but otherwise similar.

The variation cannot be well expressed in words, but the measurements may show more and the females may be useful. So far the western crested bird has been named twice on account of its longer crest, and on the east the Herzog Mts. and the Huon Peninsula forms have been differentiated. Thus it will be seen that there is a wide hiatus between the eastern and western ones to be bridged, and Captain N. B. Blood has discovered a long crested

bird in the Mt. Hagen district which is here described. The bill is very short and the crest is very long. The forehead and front part of the crest are olive brown, the feathers of the crest yellowish near the base but becoming orange towards the tips which are speckled with olive, the lateral feathers being olive as are all the upper-surface, wings and tail. The throat is yellowish brown, showing a few light shaft streaks, the breast dark olive green, with

also a few light shaft streaks, the abdomen vividly contrasting pale rufous olive; the under wing coverts pale rufous yellow, the inner wing lining pale yellow. The measurements are crest over 100 mm., bill from nostril 13 mm., wing 135 mm., tail 100 mm., tarsus 35 mm. This will provide another subspecies for consideration, as the bill is short, the wing short, but the tail long and the under-surface is distinctly coloured.

THE ORANGE-CRESTED GARDENER

Plate XXIX, Figs. 1 and 2

Many of the strange birds from New Guinea have been described from females, probably with the pious hope that the male would prove the distinction correct. This species was one of the lucky cases, as when Sharpe saw the uncrested female he was doubtful of separating it from the already known uncrested Gardener. But at last he decided, on account of its striped under-surface and its slightly different wing lining, to take the risk. His joy can be imagined when the male turned out to have a magnificent orange red crest of a style not previously seen or even thought of in this connection. Sharpe suggested that perhaps *inornata* might have been created for a female and that its unknown might be crest bearing. The truth is now known that *inornata* is always crestless.

Apparently each form builds a special "bower" very unlike the original "bower" of the Australian Bower Birds, and the bower of the present species has been described thus: "This bower is built of twigs arranged in the shape of a hollow circular basin, about 3 feet in diameter, the side being some 6 inches higher than the centre. The whole of the basin is covered with a carpet of the greenest and most delicate moss, which, as it is of a different kind to that growing around on the ground, trees, roots, etc., led me to con-

jecture that it had been planted by the bird itself. The surface is scrupulously cleared of all leaves, twigs, etc. In the centre of the basin a small tree, without branches, about 2 inches in diameter, is growing. Immediately around this tree, and supported by it to a height of about 2 feet, is erected a light structure of small sticks and twigs, placed horizontally, and crossing one another. On the extreme outer edge of the basin a more substantial collection of twigs had been built up, which was arched above so as to join the collection around the centre pole, leaving a clear space beneath for the bird to pass through in his gambols. The basin has two entrances leading into it. They are four or five inches apart, and are formed by a depression or gap in the outer rim. The bower is placed immediately to the right of the entrances. At the opposite side to the entrances, and on the highest part of the raised rim of the basin, is placed a quantity of black sticks (4 inches or so in length), black beans, and the black wing-coverings of large *coleoptera*. Black is evidently the most attractive colour to this bird."

Goodwin had previously published an impression of a bower found on Mount Belford: "At a short distance off the bower from the back looks like a cartload

of sticks rounded on the top. On going round to the front I saw the most beautiful building ever constructed by a bird, to which, however, my poor description cannot do justice. The edifice was dome-like, only half covered over, and exposed to view, inside a ring or circus. In the centre of this was built a bank of moss, decorated with flowers and seed, out of which grew a small tree interlaced with sticks."

Sharpe's description of the female reads "more dingy in colour below, being dusky brown, with fulvous centres and fulvous shaft lines, under wing coverts and inner lining of quills, rich ferruginous instead of orange buff." Finsch and Meyer from Hunstein's birds were able to add: "The male possesses a deep orange red erectile hood; it is otherwise like the female which Sharpe describes, but altogether rather more olivaceous, and has

bright shaft stripes on the throat; the reddish orange coloured hood is bordered on the sides with dark brown, and has dark tips on some of its middle feathers; the front is dark as in the female. The bill is considerably smaller than in *A. inornata*."

This species has a very restricted range as far as is known at present, and may show altitudinal variation, as the original birds were collected at comparatively low heights, and it has been recorded up to 9,000 feet. A bird from Mt. Belford 6,000 feet had the crest almost completely deep orange red without any dark edgings, while the throat was pale brown, the breast dark brown and the abdomen paler again, the feathers in each case bearing a light medial stripe; above the back, wings and tail were dark olive brown, the rump a little paler, the under wing coverts bright rufous, the inner wing lining rufous.

NEWTON'S BOWER BIRD

Plate xxv, Figs. 1 and 2

The Bellenden Ker district in North Queensland constitutes a small zoological "island" with a characteristic faunula whose relatives have vanished and whose relationships appear to be with New Guinea rather than with the surrounding Australia. As in so many instances a strange-looking female was first collected and it was so strange that a new genus was provided for it by De Vis, and the species was named after Professor A. Newton, the name being *Prionodura newtoniana*. The collector had been the indefatigable Kendal Broadbent who also went to New Guinea and collected on the south-east coast. It was a dull coloured bird, and when a beautiful brightly coloured bird was found by Meston on the Bellenden Ker it was also dignified by generic rank and nomination after Meston as *Corymbicola*

mestoni before it was seen that these were male and female. It was soon rectified and it was found to be a bower builder with a building unique in Australia.

"*Prionodura* is emphatically a Bower Bird. Both its observers in nature met with its bowers repeatedly and agree in representing them to be of unusual size and structure. From their notes and sketches it would appear that the bower is usually built on the ground between two trees or between a tree and a bush. It is constructed of small sticks and twigs. They are piled up almost horizontally around one of the trees in the form of a pyramid, which rises to a height varying from four to six feet; a similar pile of inferior height, about eighteen inches, is then built round the foot of the other tree; the intervening space is arched over with stems of

climbing plants, the piles are decorated with white moss, and the arch with similar moss mingled with clusters of green fruit resembling wild grapes. Through and over the covered run play the birds, young and old, of both sexes. A still more interesting and characteristic feature in the playground of this bird remains. The completion of the massive bower so laboriously attained is not sufficient to arrest the architectural impulse. Scattered immediately around are a number of dwarf hut-like structures—'gunyahs,' they are called by Broadbent, who says he found five of them in a space of ten feet diameter, and observes that they give the spot exactly the appearance of a miniature blacks' camp. These seem to be built by bending towards each other strong stems of standing grass and capping them with a horizontal thatch of light twigs. In and out and around 'the gunyahs,' and from one to another, the birds in their play pursue each other to their hearts' content."

Later was recorded: "Found at all heights to the summit of Bellenden Ker, whereas towards the base of the mountain the bowers have the elaborate formation noted above, at higher levels they gradually lose their distinctive character, and at the top are reduced to the simple trough-like form of the bower of the Regent—and Satin—birds, for which they might be mistaken were those birds inhabitants of the district."

Meston added: "The note of the female—a bird of common grey plumage—is that of the ordinary green Cat-bird, in a sharper and shriller key. The male appears to possess the marvellous imitative powers of the Australian Lyre-bird. First you hear him croaking like a Tree Frog, and this note is followed by a low, soft, musical, pathetic whistle, succeeded in a rapid succession by an astonishing imitation of apparently all the birds in the scrub."

This strange bower-building bird of Northern Australia is quite unlike any other local bird, and a genus *Prionodura* was introduced at its discovery, which was of a dull coloured female. The coloration of the male is green and yellow with a short crest on the back of the crown; this crest, a large back of the neck patch, all the under-surface save the upper throat, and most of the tail is yellow, the rest green. The bill is short and stout, compressed laterally, culmen arched and keeled, the tip short, obsoletely posteriorly notched, edge straight, nasal groove short, completely feathered, concealing the nostrils; under mandible almost as deep as upper, interramal space broad nearly half the length of the bill, gonys curved ascending. The wing is fairly long, feathers pointed, first narrow, a little more than half the length of the third, which is subequal with the succeeding three, these four being the longest, the eighth about equal to the second and longer than the secondaries, which are not very broad, round end, and decreasing inwards. The tail is long and peculiar, being a rounded wedge, but with the two innermost pairs shorter, the pair next to the centre about equal to the outermost, the middle pair shorter, the upper and under tail coverts short.

The legs are short, not very stout, the front smooth with faint indication of scutes anteriorly, the back bilaminate, the feet delicate, the frontal toes long and slender, the middle toe about as long as the inner toe and claw, the outer toe slightly longer than the inner, claws small, the hind toe stouter but not very long, claw small but stouter than others, the middle toe and claw exceeding the hind toe and claw.

There is only one species, *newtoniana*, and the details of coloration follow: The top of the head, sides of face and under chin bright green, a small crest of bright yel-

low on the hinder part of the crown succeeded by a band of green on the nape, back of neck yellow again, sides of neck green, as all rest of upper-surface; wings brown with green edges, the green increasing on secondaries whose tips and inner webs remain brown; there is a golden sheen on all the upper-surface, the crest and neck patch golden yellow in the light, the upper-surface golden green, the under-surface is yellow with a similar golden sheen in places, the bases of the feathers blackish; the under wing coverts bright yellow, inner wing lining pale yellow; the two central tail feathers brown with a greenish tinge basally, all the other feathers bright pale yellow, the two pairs next

the middle with brown tips, the innermost large, nearly half the length of the feather, the next only a short terminal bar, under-surface of tail golden yellow. Bill green, eye brown, legs lead blue, bill 20 mm., wing 120 mm., tail 110 mm., tarsus 30 mm.

The female is very modestly coloured, being olive brown above, ashy grey below, the inner lining of wing yellow. Measurements similar save tail which is shorter, 95 mm. From criticism of the female it is suggested that this form has evolved from a *Colluricincloid* ancestor somewhat parallel to the *Amblyornis* whose ancestry seems to be from something like *Pitohui*, which is related to *Colluricincla*.

ARCHBOLD'S BOWER BIRD

Plate xxvii, Fig. 1

An entirely new Bower Bird was discovered by one of the Archbold Expeditions which Rand dedicated to the leader as a new genus *Archboldia*, writing: "One of the large Bower Birds (wing up to 164 mm.) with a large head, related to *Amblyornis*. It is characterized by the bill being laterally expanded at the base, the width at nostril being about equal to its depth at nostril; the nostril and part of the floor of the nasal fossa being bare, the feathering not reaching within two millimetres of the nasal openings, and these feathers, tending to be bristly and curving back to be appressed to the head; by the strongly double rounded tail, the outer and the central tail feathers about 10 to 15 mm. shorter than longest; by the peculiar texture of the plumage, the feathers having downy bases and firm terminal portions, which have in some lights a darker coloured tip, giving a scaled appearance. Genotype *Archboldia papuensis*. Type adult male. Bele River 2,000 metres 18 km. north of Lake Habbema, Snow Mts.

Netherlands New Guinea, December 3 1938. Archbold, Rand and Richardson. Top of head, back, rump and upper tail coverts brownish black, darker on the head, each feather with a darker tip, especially evident in certain lights, giving a scaled appearance. These feathers have a pale greyish sheen in certain lights. The alula is brownish-black. The secondary coverts are brownish black; the primary coverts brownish black with an irregular rusty orange area near their tips on the outer web; the inner web is rusty yellow except at the tip; sides of head brownish black; throat and upper breast brownish black, duller than the back, shading to greyish black tinged olive on the lower breast, flanks and abdomen. The plumage of the under parts has the same scaled appearance and pale sheen as the back, though this becomes less pronounced posteriorly; thighs brownish grey; under tail coverts brownish black tinged olive; under wing coverts brownish black; the greater

series tinged olive; remiges brownish black, primaries washed with olive on their outer web; shafts of remiges yellow below; a bright yellow band extending across base of remiges and extending half way down the wing on edges of inner webs of remiges; rectrices brownish black above, below washed olive and with yellow shafts. Adult female. Like male. Colour of soft parts. Iris dark, bill black, mandible grey at base, feet grey, nails blackish. Seven examples secured. Measurements of males: wing 155 mm., 155 mm., 164 mm., tail, central feathers, 133 mm., 122 mm., 138 mm., bill, 32.5 mm., 33 mm., 33 mm., tarsus, 41 mm., 42 mm., 42 mm.; females, wing 145 mm., 147 mm., 148 mm., 153 mm., tail, central feathers —, —, 113 mm., 123 mm., bill 33 mm., 31 mm., 34 mm., 36 mm., tarsus 42 mm., 38 mm., 37 mm., 42 mm."

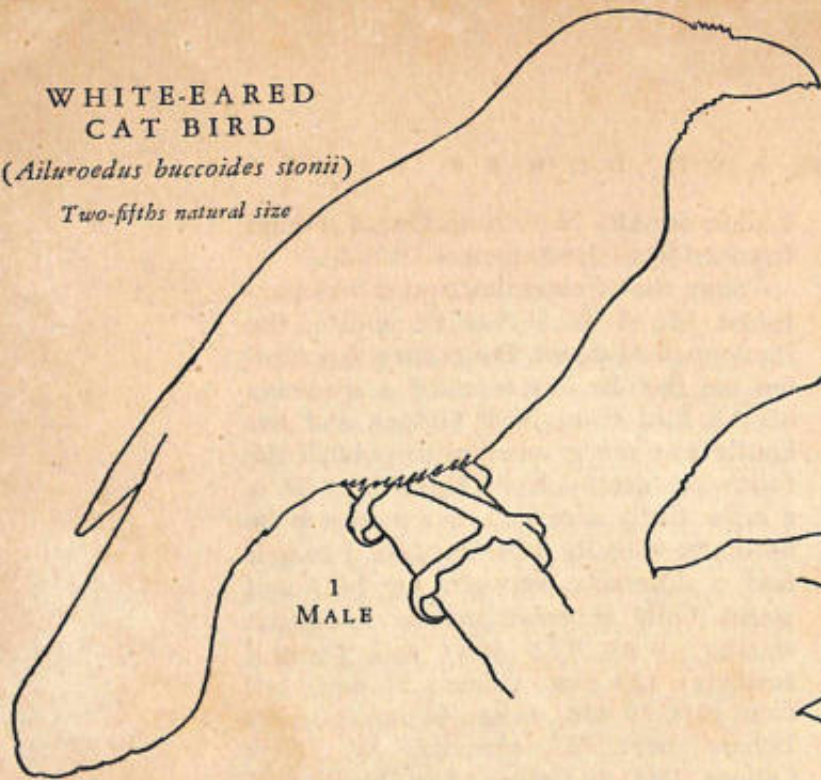
A little later Rand added a few more details as "Lake Habbema 9 km. north-east, 1 male adult, 2 females adult, Oct. 11-29; Bernhard Camp 18 km. south-west, 1 sex ? Feb. 19; Bele River 2 adult males,

2 adult females Nov. 20 to Dec. 4. Found from 2,150 to 2,800 meters altitude.

"Since the original description was published, Mr. A. C. V. van Bemmelen of the Zoologisch Museum, Buitenzorg, has written me that he has received a specimen of this bird from New Guinea and has kindly give me permission to publish the following details from his letter: 'It is a male, badly damaged, but there can be no doubt it really is *Archboldia*. I cannot find a difference between my bird and yours. Only it seems to be somewhat smaller; wing 152 mm., tail (central feathers) 124 mm., culmen 23 mm., bill from gape 29 mm., tarsus 44 mm. Locality Bobare near Wisselmeren, W. New Guinea. 1800 m. Colour of iris black. Leg. ECHOOD 14.X.1928.'

The illustration of this hitherto unfigured form has been made possible through the kind assistance of Dr. Ernst Mayr, who persuaded Mr. Antony Siedel to make a beautiful painting of the type. I have to tender my sincere thanks to the artist for his fine work, and to Dr. Mayr for his generous aid.

WHITE-EARED
CAT BIRD
(*Ailuroedus buccoides stonii*)
Two-fifths natural size



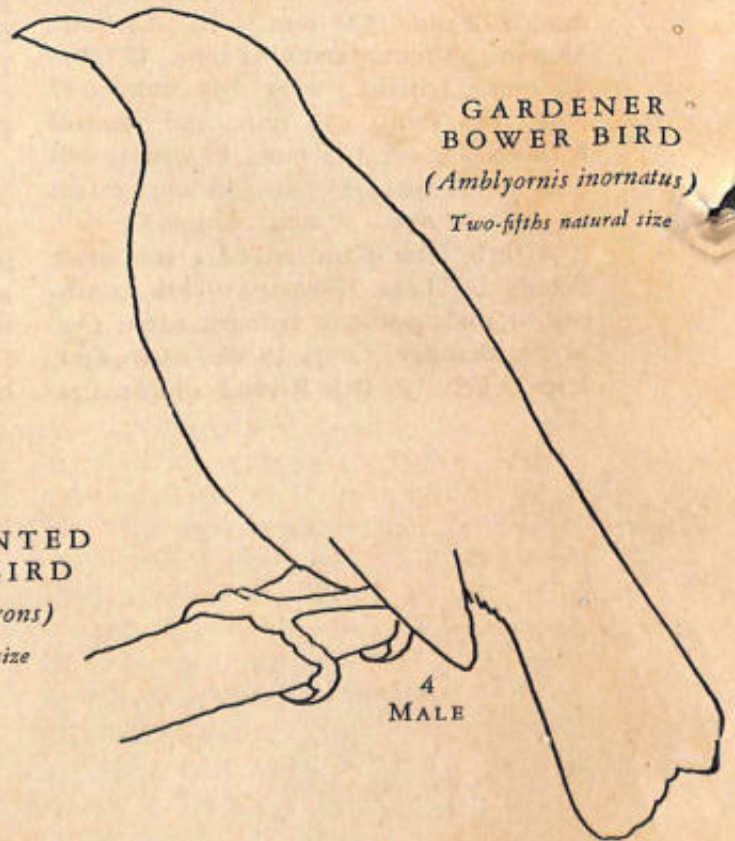
1
MALE

TOOTH-BILLED
CAT BIRD
(*Scenopoeetes dentirostris*)
Two-fifths natural size



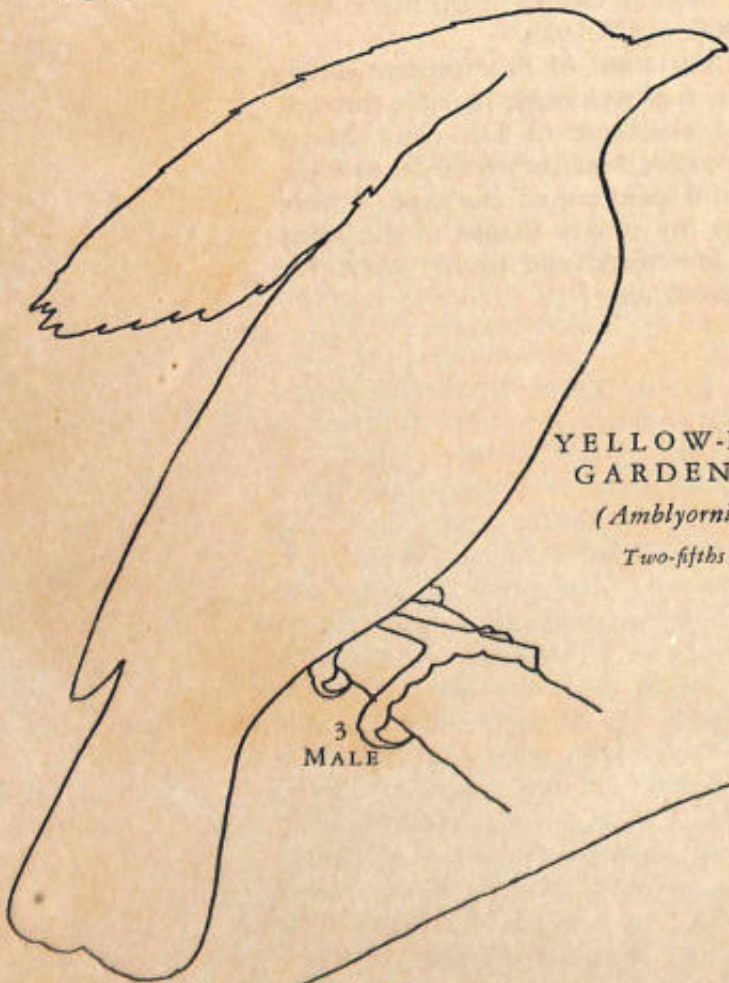
2
MALE

GARDENER
BOWER BIRD
(*Amblyornis inornatus*)
Two-fifths natural size



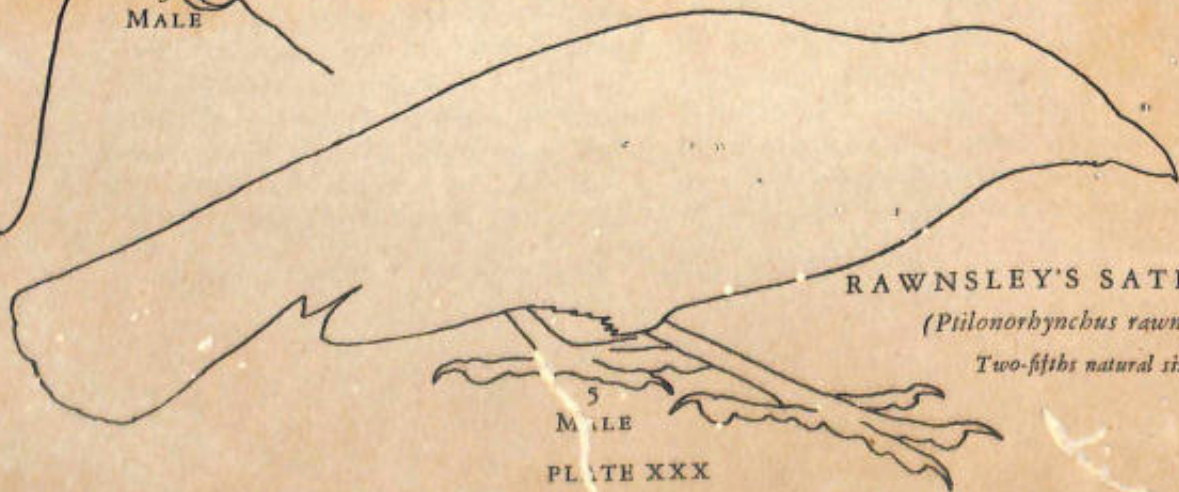
4
MALE

YELLOW-FRONTED
GARDENER BIRD
(*Amblyornis flavifrons*)
Two-fifths natural size



3
MALE

RAWNSLEY'S SATIN BIRD
(*Ptilonorhynchus rawnsleyi*)
Two-fifths natural size



5
MALE



Lilian Nedlands

CAT BIRDS

Subfamily *Ailuroedinae*

Plates xxx and xxxi

THE name, as would be anticipated, was given to this bird on account of its call, but as often occurs the catcall is not so well known in some districts as others, the birds being comparatively silent in many places. The original one came from near Sydney and was named as a thick billed Shrike; independently it was called the Green Cuckoo Shrike, while later it was associated with the Satin Bird, and at present the Satin Bird may be regarded as an abnormal offshoot of the Cat Birds. Twenty years after the local bird was named, a similar bird was discovered at Lobo, S.W. New Guinea, and was immediately recognised as being of the same form. Another twenty odd years later another similar bird was secured at the Aru Islands and since then a few variations of the New Guinea forms have been separated. Nearly twenty years after, an Australian bird, a little unlike with a heavier bill with a strong notch or tooth on the edges of the upper mandible, was discovered, and there seems little doubt that it is an aberrant relative of the Cat Birds.

The comparative abundance and variation in Cat Birds in New Guinea and their exclusive appearance in Australia only in the east suggests that they may have originated in New Guinea. Which came first, the white-eared or black-eared, is problematical at present, the former being the more variable, while the latter has

spread further. Allying the Green Cat Bird with the black-eared kinds presupposes the entry into Australia at an early date, perhaps before the development of the white-eared. This fits into the range as the latter only occurs in Northern Queensland, while the former reaches down almost into Victoria but certainly not Tasmania.

Although no suggestion of hybridisation in this group has been suggested by the hybrid-conscious workers among the birds of paradise, a hybrid has been unnaturally bred in an aviary, the parents being the Green Cat Bird and the Black-headed, one of the Black-eared series. It does not show many clues to its origin, and is a complete answer to the parentage-guesser.

The bird is large with a very strong bill, a large bare space behind the eye, the head black with oval fawn spotting (larger than in *melanocephalus*), the upper back blue with large spots of fawn; wing coverts green with blue edgings, primaries blue, as also tail feathers; throat feathers whitish with black edges; upper breast feathers blackish with oval fawn centres, lower breast and abdomen greenish fawn with dark edges; under wing coverts white with dark centres; under-surface of the tail black.

This specimen is figured and it would have been impossible to guess its origin.

THE GREEN CAT BIRD

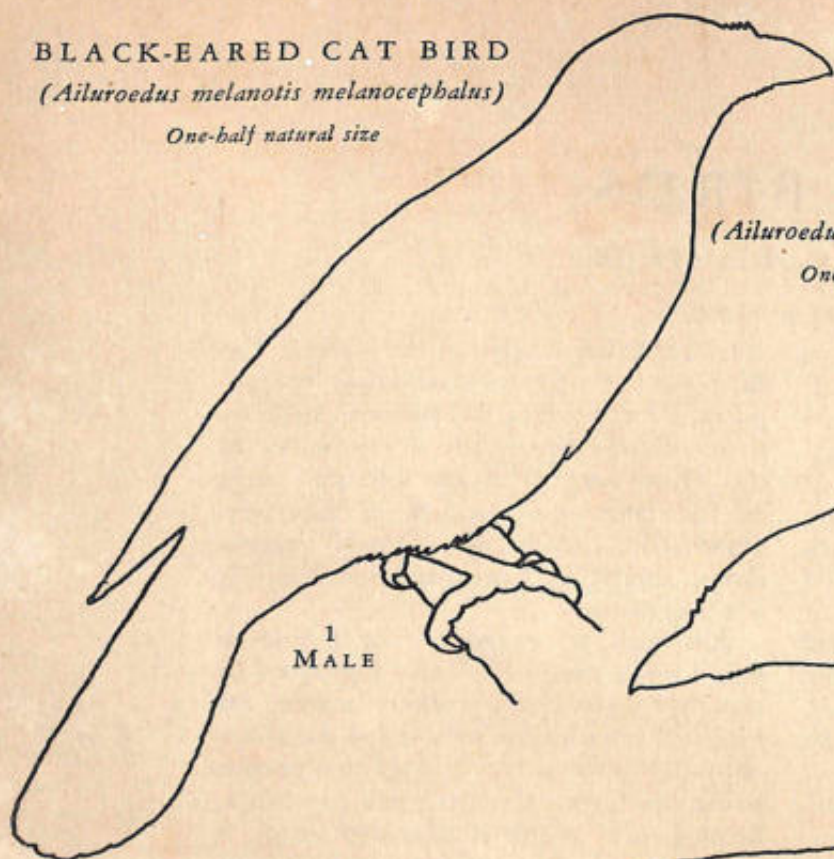
Plate xxxi, Fig. 4

The first discoverer of the Green Cat Bird is entirely lost to history, as it was described without any acknowledgment in a Swedish scientific journal, and a little later by the French ornithologist Vieillot from New South Wales. The bird is large,

BLACK-EARED CAT BIRD

(*Ailuroedus melanotis melanocephalus*)

One-half natural size

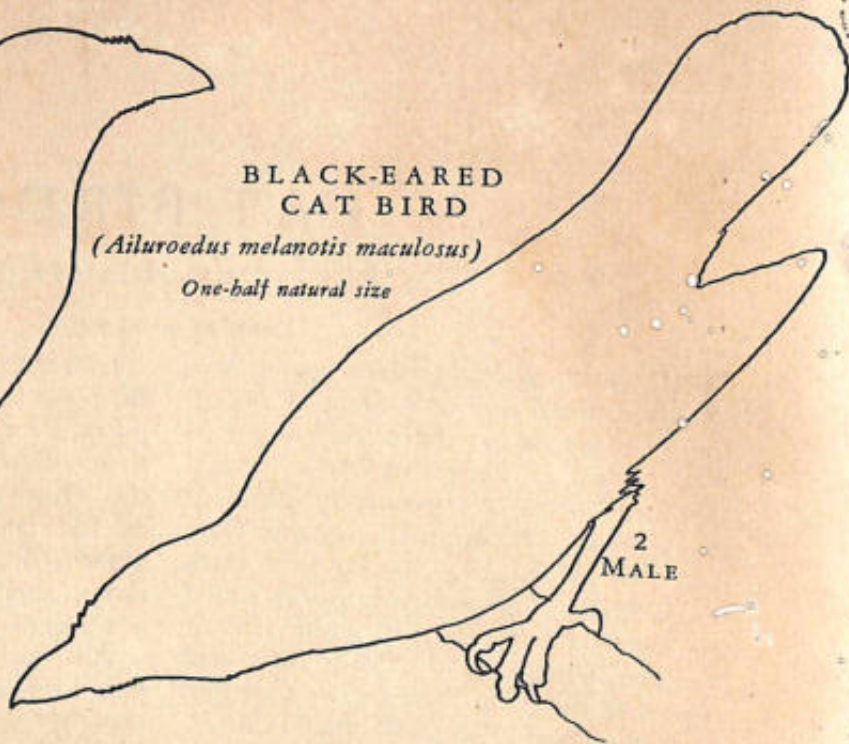


1
MALE

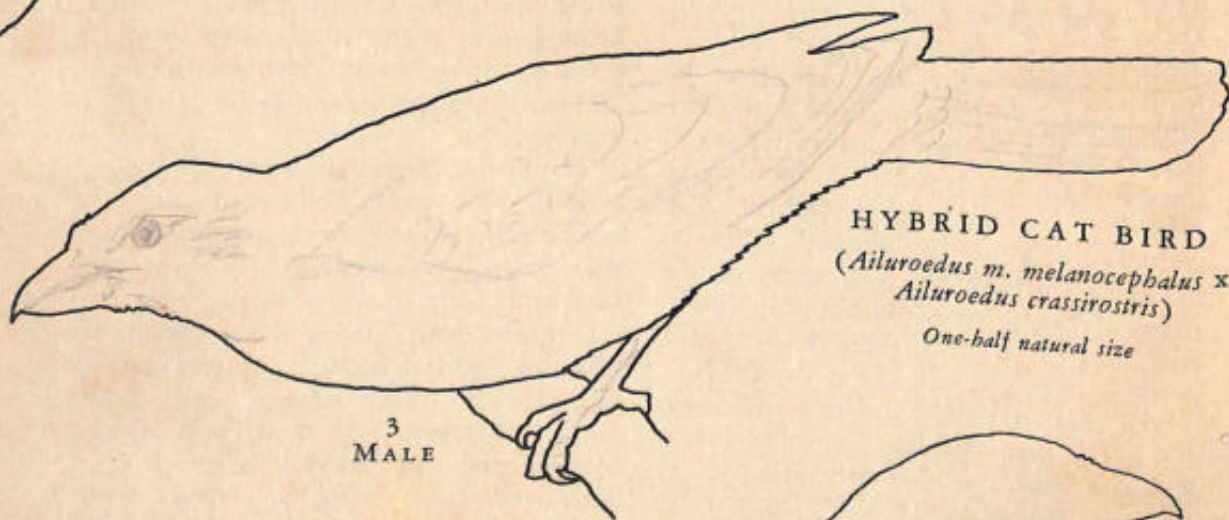
BLACK-EARED
CAT BIRD

(*Ailuroedus melanotis maculosus*)

One-half natural size



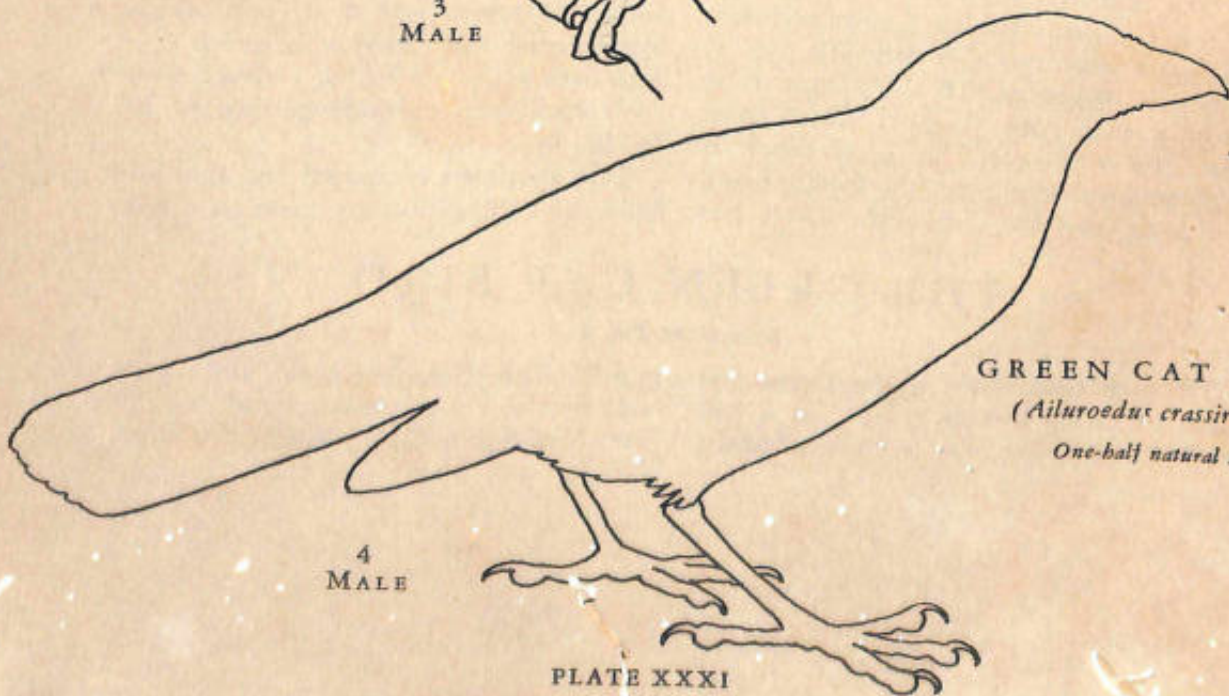
2
MALE



HYBRID CAT BIRD
(*Ailuroedus m. melanocephalus* x
Ailuroedus crassirostris)

One-half natural size

3
MALE



GREEN CAT BIRD

(*Ailuroedus crassirostris*)

One-half natural size

4
MALE



Lilian Mehlady

bulky, with a large deep powerful bill and practically all green coloration, and is easily recognised, but no one seems to have taken much notice of it.

Consequently Gould's notes are as good as any later: "This species is only found in New South Wales, where it inhabits the luxuriant forests that extend along the eastern coast between the mountain ranges and the sea. Situations suitable to the Regent and Satin Birds are equally adapted to the habits of this bird, and I have not unfrequently seen them all three feeding together on the same tree. The wild fig, and the native cherry, when in season, afford an abundant supply. So rarely does it take insects, that I do not recollect even finding any remains in the stomachs of those specimens I have dissected. In its disposition it is neither a shy bird nor a wary bird, little caution being required to approach it, either when feeding or while quietly perched upon the lofty branches of the trees. It is at such times that its loud, harsh, and extraordinary note is heard, a note which differs so much from that of all other birds, that having been once heard it can never be mistaken. In comparing it to the nightly concerts of the domestic cat, I conceive that I am conveying to my readers a more perfect idea of the note of this species than could be given by pages of description. This concert is performed either by a pair or several individuals, and nothing more is required than for the hearer to shut his eyes to the neighbouring foliage to fancy himself surrounded by London grimalkins of house-top celebrity." (Grimalkin an old word for an "alley cat.")

The Green Cat Bird is the type of the genus *Ailuroedus*, the specific name being the very apt *crassirostris*, and the genus may be thus described. The bill is short, very stout, a little laterally compressed with not much basal expansion, the body bulky, the wings long, a little pointed,

the tail long and slightly rounded, the legs medium, stout, feet medium and strong. The coloration of the type is grass green above, a few streaks on the back of the neck, the head a little mottled with darker, the secondaries with whitish tips, the under-surface with paler spotting, the abdomen almost pale yellow, as are the under tail coverts. Other species allotted to the genus show variation in coloration but very little in general structure. The bill is short, stout, very deep, subtriangulate, culmen arched, tip a little decurved, sharp, notched behind, mandibular edges straight; nasal groove short, deep, nostrils as oval open oblique apertures placed forwards in the groove, feathers approaching but not concealing them, culmen rounded, sides steep; under mandible almost as deep as upper, and depth of bill more than half the length, interramal space, small, rounded, feathered, gonys semi-keeled, long, ascending. The wing long and rather pointed, the first primary short but more than half the length of the longest, tip being formed of fourth, fifth and sixth, the fifth perhaps slightly the longest, third longer than seventh, second equalling the eighth, secondaries very little shorter, inner secondaries shortest. The tail is long, a little rounded, the feathers fairly broad, round-ended with slight apical tipping. The feet are fairly long, the outer face obscurely scutate, the back bilaminate and smooth, save a patch anteriorly which is scaly. The middle toe long, exceeding the length of the inner toe and claw, which are only slightly less than the outer and claw, claws small but sharp, middle claw long and sharp; the hind claw is stout about equal to the inner toe in length, the hind claw large and well curved, but hind toe and claw distinctly less than the middle toe and claw.

The coloration in detail of the male is grass green above with the head showing

an olive brown tinge, the shaft streaks paler, and some tips darker, the feathers of the back of the neck with clear white shaft streaks, the back and tail uniform, the tail feathers green, the shafts dark, and the inner webs of all save the central pair brown with small white tipping. The wings are also seen as green, the long wing coverts and the secondaries with a white spot at the tip on the outer web only, the primaries with grey edges and the inner webs brown. The cheeks are brownish with whitish tips, the chin and throat also brownish green with white shaft streaks and apical spots; the breast feathers green with white shaft and surrounding oval spot which grows more extensive towards the abdomen; the green becomes paler on the sides of the abdomen and in the centre the feathers are yellowish, as are all the under tail coverts. The inner small wing coverts are yellowish white with obscure pale brown tips. The bill is whitish when dead, but bluish white

when alive, the eye reddish brown, the legs fleshy brown. The bill measures 26 mm., from the nasal groove 16 mm., and depth 14 mm., wing 160 mm., tail 135 mm., tarsus 47 mm.

The female is about the same size and similar in plumage, but the female of a pair shows a darker head, a darker throat and a greener abdomen. This species is restricted in range to the coastal areas from southern Queensland to the southern parts of New South Wales. Apparently all the Cat Birds are very sedentary and somewhat variable, as many forms of the New Guinea species have been named. In the present case the early birds came from the vicinity of Sydney, either from north of the Hawkesbury or maybe National Park. The northern form *A. c. blaauwi*, has been separated on account of its darker coloration above and below, especially on the throat and abdomen, while a series from Cambewarra in the Illawarra district is obviously paler.

THE BLACK-EARED CAT BIRD

Plate xxxi, Figs. 1, 2 and 3

Wallace found this species at the Aru Islands and Gray described it as related to the Satin Bower Bird, but called it Black-eared. As this feature helps to distinguish this one from its companion in New Guinea it may be used, but this species stands out as a variable one showing slight but noticeable differences in each distinct locality. The bird is so like the Green Cat Bird in general build and body coloration that it has been placed alongside, but it is easily separated by its dark head and black ear patch. Very little has been written about its habits in New Guinea, but these are almost certainly similar to those of the Australian Cat Birds. These habits appear to be so commonplace that very little has also been written about them, although the collecting of their eggs at-

tracted quite a lot of attention in the bad old days.

Grant wrote of the Australian representative: "We found the Spotted Cat Bird all through the scrubs near the coast (in North Queensland), procuring specimens within half a mile of the beach, although they are more freely distributed on the table lands of the Bellenden Ker Range, but are nowhere numerous. Unlike the Green Cat Bird, we did not find them congregating in large flocks, but from sunrise until almost dusk they would come and go into the various fruit and berry-bearing trees in scattered pairs; their mewing or cat-like note, too, is clearer than that of the southern species. We found they resorted chiefly to a particular kind of tree bearing a lemon-like fruit, of which they

seemed exceedingly fond, and were often seen in the same tree in company with the Tooth-billed Cat Bird. The contents of the stomachs of those we examined contained portions of the lemon-like fruit previously referred to, ripe figs and berries."

The variation in the Black-eared species has led to the description of many forms, four being illustrated as distinct species in Sharpe's Monograph, *melanotis* from the Aru Islands, *arfakianus* from the Arfak Mountains, *maculosus* from North Queensland, and *melanocephalus* from South-East New Guinea. As if this were not sufficient, five have been added since, *jobiensis* from the I. of Jobi, *guttaticollis* from the mid-Sepik area, *astigmaticus* from the Huon Peninsula, *facialis* from the Snow Mountains, and *misoliensis* from Misol I. Two names were added from Queensland, *fairfaxi* from the Bellenden Ker Range, and *joanae* from Cape York, the latter probably as valid as any of the New Guinea forms.

The extremes of the coloration are easy to separate, but whether there is much constancy seems doubtful. Anyhow, these are matters of merely technical interest and the earliest and latest comments may be cited. Meyer and Finsch, discussing the south-eastern form just then named *melanocephalus*, concluded: "This species comes between *Ae. arfakianus* (from the Arfak Peninsula) and *Ae. melanotis* of Aroo, but is nearest to the former. In its throat not being black it approaches the latter, although this part is somewhat dark in the present form. In its dark head it resembles the Arfak bird, but there is no sharply defined cervical fan. The uniform green wing coverts remind one of the White-eared forms. The south-eastern form seems to be darker than the Arfak form on the under-surface of the tail, and to have a narrower terminal band. The feathers of the throat are black at the bases and tips, but have a broad white intermediate band,

so that the white predominates, whereas in the Arfak bird the black predominates. The whole under-surface is washed with olive brown, and is much darker than in the Arfak or the Aru Islands forms." Remember that the birds under consideration were from the extremes of the vast island of New Guinea. Rand, reporting the species from the neighbourhood of the Bernhard Camp on the northern slopes of Mt. Wilhelmina, found from 850 to 1,200 metres (2,800-4,000 feet), accepted the name *A. m. jobiensis*, commenting: "This series shows little variation. It has the upper parts about as in *melanocephalus* (the south-eastern form), but differs from it and all the other races in the much blacker throat, the black extending on to the upper breast, and in the reduction in size of the buffy markings of the throat to spots usually less than half the width of the feathers. The race *arfakianus* has a blackish throat with small spots on it, but is very different in the spotting of the head and throat being whitish, in the less extensive black of the throat, with more of a green band below it and in the paler, less brownish under parts."

As examples of the variation the black-headed form is figured and described alongside the Australian *maculosus*, which is the most distinct and might be specifically separated.

The New Guinea bird has the head black, each feather with a small yellowish spot, but shaft line yellow, the nape similar, but upper back with larger spots, back green with a bluish tinge, the wing coverts uniform and only small spots at the tips of the secondaries; the central tail feathers bluish green, tips small, lores and ear coverts black; throat fawnish white with black tips, lower breast and abdomen greenish fawn mottled with blackish, upper wing coverts bluish and under wing coverts black with fawn tips, inner wing

lining dark. Bill bluish white, eye brown, legs flesh brown, bill 27 mm., wing 155 mm., tail 130 mm., tarsus 48 mm.

The Australian form (species) is a smaller bird with a blackish brown head, each feather with a large yellowish spot with the mid shaft black, nape similar, upper back darker green with white spots, obsolete on lower back rump and upper tail coverts, small white spots on upper

wing coverts and secondaries; ear coverts black, chin black with white edges, throat with large white spots, breast and rest of under-surface green with white spots elongating posteriorly, under tail coverts dirty cream white, under wing coverts whitish with dark small ends, inner wing lining scarcely paler than outer webs. Bill 25 mm., wing 151 mm., tail 107 mm., tarsus 42 mm.

THE WHITE-EARED CAT BIRD

Plate XXX, Fig. 1

The first name given to this bird was Barbet-like, a Barbet being a well-known bird with a heavy bill, but some of the forms since discovered of the Black-eared species have bills scarcely any less, so that the present name is more distinctive. It lives alongside the Black-eared through New Guinea but does not accompany that species into Northern Queensland. This species was discovered first in South-West Dutch New Guinea, living on the lowlands, whilst the Black-eared occupies a higher niche though it does not go higher than about 6,000 feet. In addition to its white ear spot the top of the head is uniform, not streaked or spotted.

Claude Grant noted "was a common species (Mimika River area) inhabiting the dense jungle, and was usually seen in pairs. It was generally met with on or near the ground, and was at all times extremely wary and difficult to secure. Its peculiar hissing alarm note, not unlike the spit of an angry cat, was often heard, but the bird was rarely seen." Very similar notes have been given by the Geisler brothers from the Huon Peninsula: "Always found in pairs. The male utters its warning note—a long drawn hoarse sounding 'tschaa,' the female quickly answering and repeating the call; by these calls they can be easily tracked, but are very difficult to see in the dense undergrowth."

Rand gave no field notes on a series from the Bernhard Camp and Hollandia only observing: "It is interesting to note that the altitudinal range of this species is greater than that of *A. melanotis* and includes it. In the south New Guinea lowlands their ranges appear mutually exclusive. In south-east New Guinea *buccoides* appears to be a lowland species, *melanotis* a mountain bird. There seems to be a slight correlation between increase in size and in altitude."

In the White-eared species there is also considerable variation as three species were figured by Sharpe, *buccoides* from the south-west New Guinea, *stonii* from south-east, and *geislerorum* from north-east. Again three more have since been added, *subcaudalis* from the mountains of south-east New Guinea, *oorti* from Waijiou, and *molestus* from the far north-east coast of New Guinea. Again there is seen considerable individual variation as shown in the comments of Rothschild and Hartert many years ago: "The eastern form, *geislerorum*, is closely allied to the typical one, differing only in its lighter, more cinnamon brown crown, and frequently (though not constantly) larger black spotting of the chest. No other differences seem to be constant. Young birds of both forms, recognisable by their blackish bills,

have a darker, more olive crown, with a more or less marked, paler, irregular mesial line. It is possible that they all should be united with *geislerorum*, as those which are more like an adult *buccoides* may be immature."

Ogilvie-Grant, discussing birds from the Mimika River, wrote: "Our series of specimens may be considered as typical examples of *buccoides* which came from Lolo, Triton Bay, somewhat further west. Examination reveals the following points:

"1. All have the ground colour of the under parts dull ochre from the throat to the vent, and obviously belong to the species found in south-east New Guinea, *Ae. stonii*.

"2. The male has the bill considerably larger than that of the female (no details given!).

"3. The size of the black spots on the under part is subject to considerable individual variation, the spots being larger in younger birds and fewer and much smaller in the oldest males, with the largest bills.

"4. Specimens from south-east New Guinea can be matched exactly among birds in the present series, with the exception, perhaps, of the type specimen from Laloki River, which has the spots rather

smaller and less numerous on the breast. Adult males, wing 131-145 mm., adult females 127-134 mm."

The immature bird has the feathers of the crown yellowish buff with dark greenish middles and wing 125-126 mm.

The south-eastern bird is here described and figured. The head is dark olive brown, hind neck and sides of neck fawn spotted with black, the feathers black with fawn edges, ear patch white, upper-surface bright green, unspotted, save for small buff apical spots on secondaries; primaries and tail feathers green with a bluish tinge, the latter without pale tipping; under-surface buff from throat to under tail coverts, larger black spots on breast, smaller on lower breast and vanishing on abdomen, thighs and under tail coverts; the chin is whitish, the upper throat buffy white unspotted, under wing coverts buffy white; bill pale horn; eye brown; feet blue grey. Bill 25 mm., wing 130 mm., tail 90 mm., tarsus 38 mm. While various wing measurements have been given showing that the male is slightly larger only, van Oort has given tail measurements which show that of the female to be longer, thus adult males wings 132-133 mm., tail 86-90 mm., adult females wings 129-132 mm., tail 94-100 mm.

THE TOOTH-BILLED CAT BIRD

Plate xxx, Fig. 2

Along with Newton's Bower Bird lives a very anomalous Cat Bird in a very restricted area in North Queensland. Neither has any close relationship with any other Australian birds, nor do they approach much more closely to any New Guinea forms. While the present one is regarded as a very aberrant Cat Bird it has many habits quite peculiar to itself, such as forming "circus rings" as playgrounds. No Cat Bird is yet known to form a playground or a bower, but this

bird has a peculiar playground, somewhat unlike any other.

The bird itself vaguely recalls a Cat Bird with a strong bill with a greatly developed tooth after the posterior notch succeeding the strong tip. It is modestly coloured, being olive brown above, and the under-surface mottled fulvous and brown. Grant wrote: "I found these birds freely distributed throughout the scrubs in the mountain ranges of the Upper Russell, the Upper Mulgrave, and the Upper Bar-

ron Rivers. In the tablelands in the neighbourhood of Boar Pocket and Lake Eacham, about thirty miles from Cairns, they are the commonest birds in the bush. Usually I found them feeding in the tall fig trees, and frequently in company with the Spotted Cat-bird. They were seldom met with on the lowlands, but on one occasion I shot a pair in a fig tree opposite Double Island, about three miles from the coast. The playground of this species is formed by clearing a space, from three to five feet across, of all sticks and leaves, and placing thereon freshly gathered large green leaves of one particular kind of tree. These leaves averaged from forty or fifty to a hundred or more in number, and on some of the playgrounds I found a great accumulation of dead leaves forming a ring around them, and in several instances over a foot in height. These 'circus rings,' as we called them, were evidently made by the birds throwing or scraping the withered leaves from the frequented portion of the playground. Some are found amongst a dense undergrowth of young palms and lawyer canes; others in open parts of the scrub. During my two trips I must have seen over a hundred of them, but I never found one except in the mountain ranges. These birds generally assemble at the playgrounds early in the morning and again in the afternoon. Usually three or four birds were seen playing about them, picking up the leaves and tossing them about or turning them over; or gambolling and chasing one another. All the while another bird perched in a bush close by was pouring out its loud and melodious notes, which are uttered very rapidly and continuously without intermission, for some considerable time. The leaves are thrown from the centre to the outside of the ring, all withered ones being placed on the edge of it. Fresh leaves are picked and used for their evolutions every day. In addition to its rich

and varied notes, it is also possessed of ventriloquial powers, which render it exceedingly difficult to locate, even when singing near at hand. The contents of the stomachs of those I examined contained various fruits, berries, and the remains of Coleopterous insects."

Day added: "They are usually associated in small flocks, and may often be seen in company with the Spotted Cat Bird, feeding on the different berries and fruits which constitute their food. The playground of this species is a very simple one. Clearing a space about three feet in diameter of all sticks and leaves, and usually between two small trees, they place fresh green leaves flat on the ground in the centre of the circle. This is resorted to by from two to ten or twelve birds, who toss or move the leaves about, but, unlike Newton's Bower Bird, never fight at the playground, although they do so frequently with each other when feeding in the trees. The green leaves vary from ten to over a hundred, according to the number of birds frequenting the playground, which is resorted to all the year round. All the green leaves taken from one measuring three feet four inches in diameter amounted to twentyeight, and in the centre of the circle were two deep, being more scattered around the edge. The leaves are long, varying from six to ten inches in length, and from one and a half to two inches in breadth. These are identified as belonging to *Nephelium callarie* with the upper side of leaves green, glabrous, under side almost white."

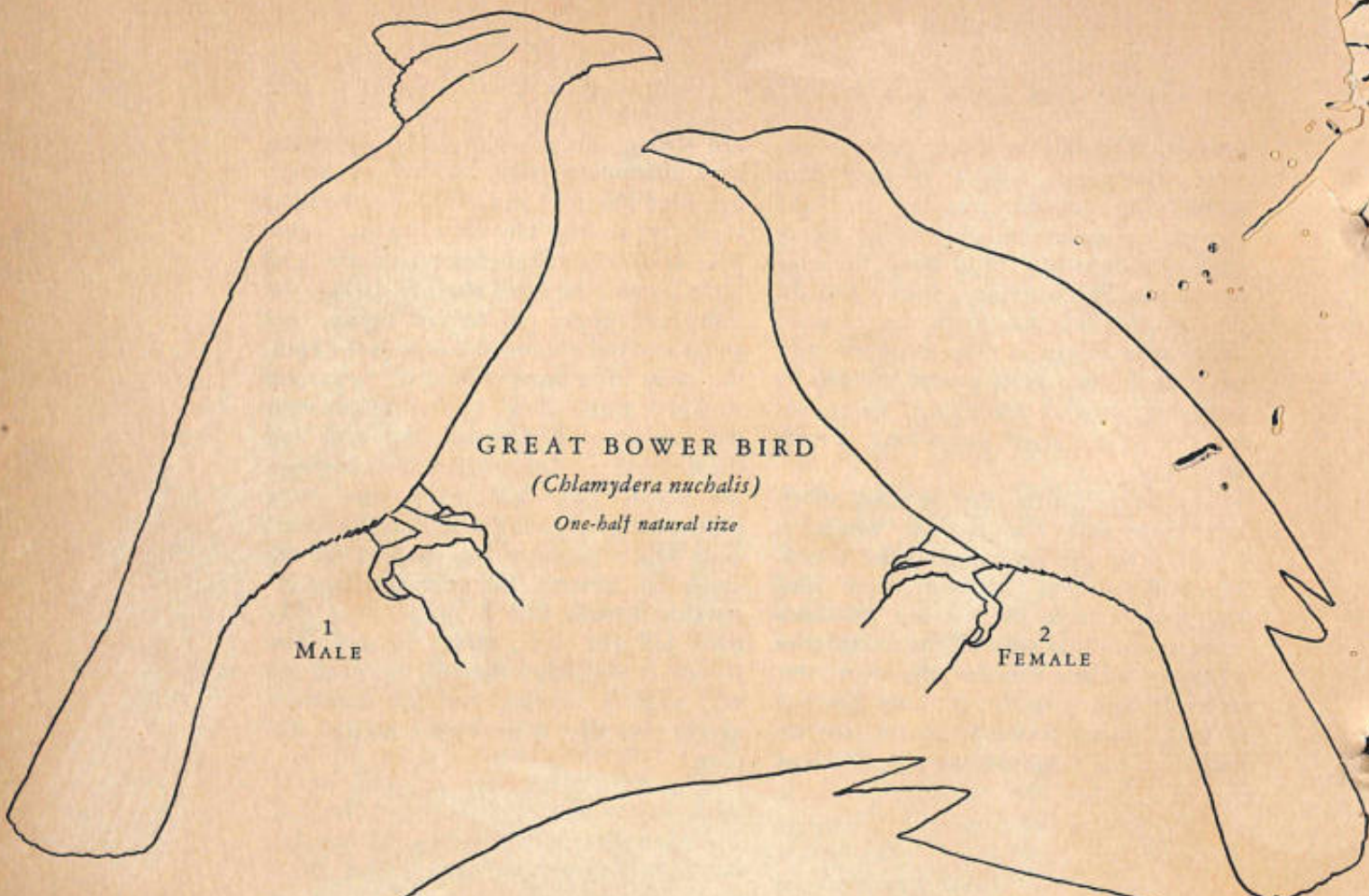
Hislop also mentioned that the leaves are placed with the white under sides uppermost. They are excellent mimics of the notes of other species.

The genus is mainly separated on account of the prominent tooth on the bill. Really it is only a little exaggerated, but the bill being more curved it is much more

notable. The bill is short, stout, somewhat triangular, deeper at base than width, the culmen rounded, strongly curved, tip decurved, posteriorly deeply notched following a strong tooth, the edge of the mandible curving a little upwards, thus emphasising the tooth; under mandible deep, almost as deep as upper; nostril oval in deep short groove, hidden by projecting frontal feathering; interramal space small, feathered, gonys long, curved, ascending.

The wing has the first primary short, less than half the second, which is equalled by the secondaries, the fourth and fifth subequal and longest, the third and sixth a little shorter, the primaries rather narrow and pointed, the secondaries a little broad and rounded, the inner (tertiaries) decreasing rapidly inwards. The tail is long, broad feathers, square, coverts long, half the length of the tail. The legs

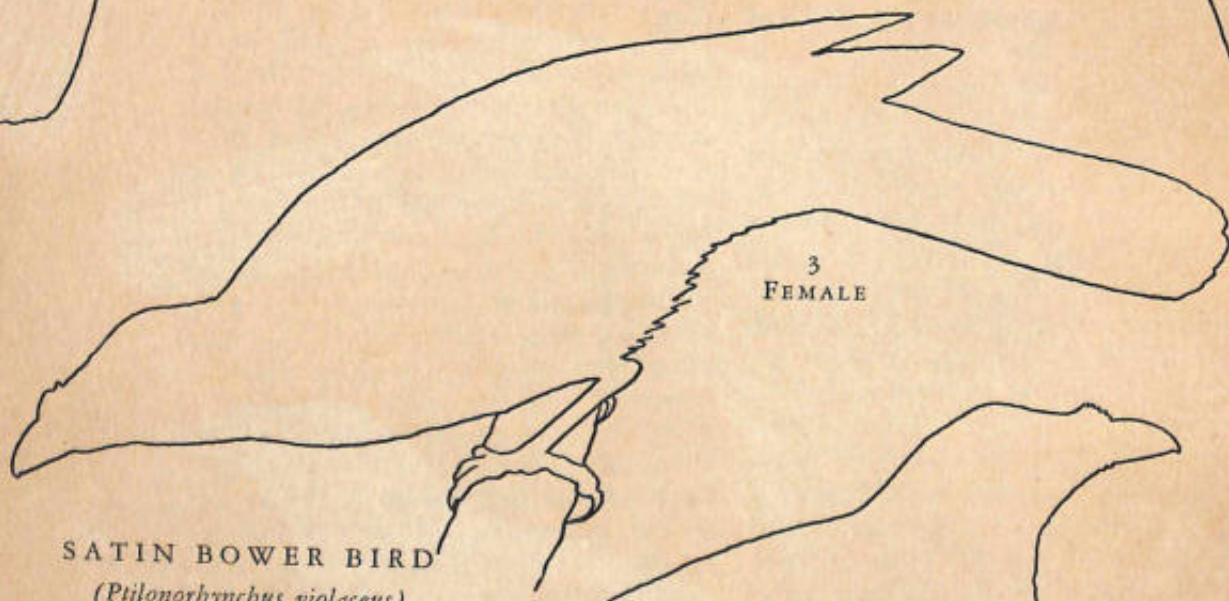
are strong, the front weakly scutellate, back bilaminate, front toes long and slender, hind toe stout and very long, the hind claw very strong. The only species, *Scenopoeetes dentirostris*, has the back and head olive brown, the head slightly darker, the rump and upper tail coverts lighter, the wings and tail are concolour with the back, the inner webs brown; the ear coverts are streaked with white shafts; underneath the coloration is fawnish, the chin and throat feathers with small brown edgings, the breast and abdomen having large brown margins giving a scalloped appearance which becomes less marked on the under tail coverts. Bill, eye and legs all reddish brown. Bill 23 mm., wing 153 mm., tail 108 mm., tarsus 33 mm. The female is similarly coloured, but probably very slightly smaller, and the immature agrees save that it shows the juvenal tipping.



GREAT BOWER BIRD
(Chlamydera nuchalis)
One-half natural size

1
MALE

2
FEMALE



3
FEMALE

SATIN BOWER BIRD
(Ptilonorhynchus violaceus)
One-half natural size



4
MALE



Lilian M. ...

SATIN BOWER BIRDS

Subfamily *Ptilonorhynchinae*

Plate xxxii, Figs. 3 and 4

THIS must have a heading to itself, as, though it may be related to the Cat Birds, the male has achieved a very distinct and beautiful plumage. As mentioned already, it has been more studied than all the other Bower Birds put together, and so many interesting traits have been noted that it has been called the cleverest bird on earth. It was the first bird to be recognised as a bower builder, but that is merely a part of its work, as having achieved the building of the bower it began to decorate the ground with little ornaments, and for some unknown reason selected blue. In every bower articles showing blue were found, and as civilisation began to crowd its haunts it started to select articles of blue colour such as blue marbles, blue paper and blue bags! Then apparently not satisfied with waiting for blue to turn up, began painting. The bird itself is rather a bulky bird of glorious satin purplish black with pale whitish legs and feet, the bill pale bluish, and the eye bright pale blue. The female is quite unlike in coloration, being a greyish green above, the under-surface being yellowish green, the feathers margined with blackish brown providing a strongly scalloped appearance; and the young are similar. In structure it gives away no secrets, so that it remains one of the anomalous birds whose relationship is obscure, while its bower-building faculty does not help much, as it is just as unlike any other bower builder. In addition to its painting achievement as noted hereafter it is an excellent mimic.

Again the history of this glorious bird is lost, as it was described from a specimen in France without note of who brought it. Other specimens were appar-

ently brought to Europe about the same time as it was noted as being in many museums and private collections very shortly afterward.

Although Gould was the first to report in England that Australia possessed birds which built extraordinary playing bowers, apparently the discovery was due to his brother-in-law, Charles Coxen, who came out to the colony and apparently also may have induced Gould to make this world-famous Australian trip. Gould stated: "The bower-like structure first came under my notice in the Sydney Museum, to which it had been presented by Charles Coxen, Esq., of Brisbane, as the work of the Satin Bower Bird. This so interested me that I determined to leave no means untried for ascertaining every particular relating to this peculiar feature in the bird 'economy'; and on visiting the cedar brushes of the Liverpool range, I discovered several of these bowers or playing places on the ground, under the shelter of the branches of overhanging trees, in the most retired part of the forest; they differed considerably in size, some being a third larger than others . . . The interest of this curious bower is much enhanced by the manner in which it is decorated with the most gaily coloured articles that can be collected. The propensity of these birds to fly off with any attractive object is so well known to the natives that they always search the runs for any small missing article that may have been accidentally dropped in the brush."

As to natural and artificial methods, Strange reported: "My aviary is now tenanted by a pair of Satin-birds, which for the last two months have been constantly

engaged in constructing bowers. Both sexes assist in their erection, but the male is the principal workman. At times the male will chase the female all over the aviary, then go to the bower, pick up a gay feather or a large leaf, utter a curious kind of note, set all his feathers erect, run round the bower, showing off apparently in a sexual display."

Recent intensive study, as noted below, has not shown the sexes to work together nor does the female resort to the bower to allow sexual display; it may be that the habits of individuals vary in different localities, so there is much yet to do.

So much has been written about the Bower Birds of Australia in the reference books on Australian Birds and also in the scientific periodicals such as *The Emu*, etc., that the reader must be referred to these for further information. Here follows a few extracts from an excellent account by Chaffer of the Satin Birds of National Park, near Sydney, New South Wales: "The Satin Bird will often build its bower in the same favoured locality for long periods. I know two other birds whose bowers have been constructed in the one locality for at least seven years. The bowers of these birds have been wiped out by flood or bush fire on more than one occasion, but were again rebuilt. The bower may be taken as a fairly typical specimen. Two walls of about 12 inches long and 14 inches high are spaced about five inches apart. Each wall is somewhat concave at the base of the interior, forming a roundish space in the centre of the bower. The more or less upright sticks of the walls curve inwards at the top, forming an incomplete arch. The walls are usually of equal thickness, but this year the bower has been maintained with one wall considerably thicker than the other—four inches and six inches respectively. At the front of the bower is the platform, an inch or two thick, covering a space of

approximately 28 inches by 24 inches, and composed of grasses. It is on this platform that all the decorations are placed, none being found between the walls. It has been suggested that the more flimsy and less finished bowers are the product of young birds, but this is certainly not always the case. Again a bower which appeared to be used only by green birds—young males, I believe—was of average construction. One peculiar part of bower construction is the aspect in which the bower is built. Almost invariably the walls run in a general north and south direction, and the platform is usually placed at the northern end; with one exception all pointed in the same direction. The exception was constructed with the walls running due east and west, and the platform at the western end. Other observers have also noted the north and south direction, but the reason for such preference is obscure.

"A good deal has been written of the bird's preference for blue, and to a somewhat lesser extent for yellowish-green objects in the decoration of its bower. A surprising variety of materials may be found at a bower. The following list of materials was noted in a bower at one time: 8 blue bags, 10 pieces of blue matchboxes, 1 blue State Express cigarette packet, 1 blue envelope, 1 piece of blue string, 34 pieces of blue glass, 17 blue feathers, 1 blue marble, 1 car park ticket white with blue printing, 4 blue chocolate papers, a blue invitation card, 8 yellowish wood shavings, 2 pieces of yellowish green onion peel, 8 snail shells, 1 cocoon, 6 cicada cases, numbers of blue and yellowish green flowers, and a very large number of yellowish green leaves, mostly the stiff serrated leaves of the banksia. An extensive picnic flat had formed a happy hunting ground for this bird. Wild berries form the principal food of the Satin Bird, but insects enter largely into its

diet. One day I was watching a cloud of white ants (Termites) emerging from an old stump, greatly resembling, from a little distance, smoke issuing from a ship's funnel. As I watched them, a blue 'Satin' skimmed down the hillside, and alighting on the rim of the stump, commenced an onslaught on the winged insects, devouring a great number. Cicadae are also a favoured food. In some places the orchardists claim the Satin Birds are a great pest. Flocks of them entered the orchards, and were particularly severe on cherries and strawberries. The habit of constructing and decorating a bower does not constitute the whole of the remarkable Bower Bird's achievements. To its architectural accomplishments it adds that of an artist, for the interior of the walls of the bower are stained to a height of several inches with a pigment-like material. This unique habit of painting the bower has only been brought under notice within recent years. It has been confirmed by several observers. The first suggestion was due to the occurrence of flat circular wads of fibrous material lying between the walls of the bower (decorations and all other objects are rigorously excluded from the interior of the bower). Careful watch saw the bird make use of these wads as brushes, charcoal mixed with saliva from the bird's mouth being the material used. The painted sticks when rubbed with one's fingers leave thereon a black pigment-like material. Small pieces of charcoal are usually to be found on the bower platform. These, if not required for a definite purpose, would be thrown out, as they do not enter into the bird's colour scheme. The operation has been completely seen; the bird arrived with a small bundle of material, which he deposited on the edge of the platform. This material was found to be small pieces of fibrous bark some two or three inches in length. Seizing one piece by the centre, it was gradually drawn

into his mouth by a sort of nibbling action of the mandibles. He then approached the bower, and commenced to paint. The fibrous pad was held wholly within the bill, and approximately midway between the base and the tip, during the painting operations. I do not know whether he had any of the colouring material in his bill when he arrived, but am inclined to think that on this occasion the paint on the sticks was only being freshened up with saliva. Each stick was carefully and unhurriedly coated. The head, held sideways, was moved up and down, the sticks sometimes being passed between the mandibles. Moisture exuding from the sides of the bill was wiped on to the sticks. After painting for a few minutes, the bird flew off, but soon returning, selected another piece from the bundle previously gathered. The same manufacture of the wad was carried on, and the painting renewed. During the spring the bower is in almost constant use, and the bird remains in the vicinity for the greater part of the day. A favourite perch is in a turpentine tree overlooking the bower. Here for long periods the bird quietly preens his feathers. At other times he would go through various peculiar antics. He would slowly stretch his head and body forward, and then with two or three quick, jerky movements, regain the normal position. Again, he would take a few quick side steps along the branch, accompanied by a sudden opening and closing of the wings and spreading of the tail. He called meanwhile with a number of low, throaty and churring notes, some of which appeared to be mimetic in character. As the season advances, the bird restricts its visits more and more to the early morning, but may on occasion be seen throughout the day. The bird never tires of rearranging the various decorations, often carrying them around and through the bower before replacing on the platform. Again, some of

the sticks forming the bower will need rearranging, or others need to be added thereto. Seizing a stick in his strong bill, he rams it firmly and forcefully into position, twisting the head sideways to carry out the operation. All these operations are carried out in a deliberate, unhurried manner, the bird moving about with a peculiar gait, half walk, half hop, with feet planted well apart and tail depressed. I have watched the bower on a good many occasions, but have not as yet seen a female in the vicinity. The adornment of and play at the bower appears to be carried out mainly for the bird's own edification. On one occasion a strange male put in an appearance and commenced to pull up and scatter the sticks in all directions. He worked hurriedly, as though afraid of the return of the rightful owner. Another time a strange male was witnessed destroying the bower, when the owner arrived and quickly drove off the intruder."

The genus has only one known species, a second described being regarded as an aberration; the genus was obviously determined through the unique coloration which was confirmed by the nostrils being hidden by feathers. The bill is short, very stout, triangular, culmen strongly arched, rounded, tip sharp, posteriorly notched, the edge of the mandible curving upwards towards the head; the nostrils and nasal groove completely hidden by a thrust forward tuft of feathers closely appressed to the base of the bill, which is not very broad; the bill is deep basally, the interramal space very small, feathered, gonys a little upcurved. The wing feathers are

narrow, the first primary more than half the length of the fourth or fifth, which are subequal and longest, the third and sixth little shorter, the second equal to the seventh and longer than the secondaries which are broad, round tipped, the inner (tertials) decreasing inwards, the secondaries shorter even than the innermost primary. The tail is long, square, the feathers fairly broad, the coverts about half the length of the tail, the under coverts a little shorter than the upper. The legs long and stout, the front strongly scutellate, but sometimes showing signs of fusion, while the bilaminate back may show scaling anteriorly. The feet are large, claws fairly long, but the hind toe stouter and the claw stronger, so that the hind toe and claw are longer than the middle toe and claw.

As already noted, the male is satiny black with a strong purple sheen above and below, the sheen less noticeable on the wing and tail feathers save on the edges, where it shows a bluish tinge also. Bill from nasal groove 23 mm., wing 173 mm., tail 115 mm., tarsus 57 mm.

The female is blue grey above, the feathers with green bases, the wings and tail brown, the inner webs being darker; underneath grey each feather margined with brown, presenting a horseshoe pattern, the under wing and under tail coverts similarly marked, inner wing lining bright yellow. Measurements are about the same, although the tail of the female may be longer. The immature is like the female, but is easily distinguished by its juvenal plumage tipping.

RAWNSLEY'S SATIN BIRD

Plate XXX, Fig. 5

Unfortunately, nothing is known of this bird save what was written at its introduction by Diggle, who described it: "Head, throat, neck, chest, abdomen, back,

upper and under tail coverts, rich glossy bluish black, wing coverts and spurious wing, jet black, edged with the former colour; primaries black, with the exception of

a small portion of the outer webs, and a large portion of the inner webs near the base, which are of a bright yellow colour; the secondaries are brilliant orange for the greater part of their length, their basal portions being edged with black, and have a large rounded or oval patch of black near their tips; a narrow stripe of deep orange runs in a wavy form through the centre of the outer webs of the tertiaries, the inner webs being wholly black; the two middle feathers of tail jet black, the remainder the same, slightly tipped with golden brown; feet olive black; bill the same but lighter at the tip; irides greenish blue. Length $11\frac{1}{4}$ inches, wing 6 in., tail 4 in., tarsus $1\frac{3}{4}$ in., bill $1\frac{1}{4}$ in. This splendid new species must be regarded as a most interesting addition to the avifauna of Queensland. The strong resemblance in its colouring to the common Satin Bird, and also the Regent Bird, might lead to the suspicion of its being a hybrid, but the important testimony of A. C. Gregory, Esq., the explorer and now Surveyor General of Queensland, will have much weight in assisting the naturalist to a right conclusion. The specimen from which my figure is taken was submitted to the inspection of that gentleman, who immediately recognised it as a species seen by him on his route from the Gulf of Carpentaria to Moreton Bay, about the month of October, 1856. The locality was the Suttor River, a branch of the Burdekin. Mr. Gregory always took considerable trouble to distinguish the different notes of birds and cries of bush animals, knowing that the natives frequently use them

for their own purposes as decoy notes or signals of communication; and his attention was drawn to the present species from its peculiar note, which was a prolonged 'o-hoo' several times very distinctly repeated, the same being in a minor key, giving it a very plaintive character. Mr. Gregory states that he had an excellent opportunity of observing its plumage, and cannot possibly be mistaken; and that, on mentioning the circumstance to Mr. Elsey, the surgeon and naturalist attached to his party, it became a matter of discussion between them as to whether it ought to be placed in the genus *Ptilonorhynchus* or *Sericulus*. The country in which it was seen was an open box flat, with brigalow scrubs in the neighbourhood. The present specimen was obtained by H. C. Rawnsley, Esq., in the scrub behind his house, at Witton, on the River Brisbane, a few miles from the city on the 14th July, 1867. As a naturalist possessing a large acquaintance with Australian ornithology, I have much pleasure in dedicating this bird to him."

As no further specimens have turned up, this bird has been written off as a hybrid, as mentioned by Diggles, but his figure shows nothing to confirm such a suggestion, as it displays a typical *Ptilonorhynchus*. Unfortunately the specimen is missing, as it seems to have gone astray somewhere, so it cannot be re-examined. There is still, however, the mystery of Gregory's Suttor River bird, which is entirely out of the known range of the Regent Bird.

TRUE BOWER BIRDS

Subfamily *Chlamyderinae*

Plates xxvii, xxviii, xxxii, and xxxiii

A NATURAL series of bower-building birds, ranging throughout Australia and occurring in New Guinea, but not in Tasmania, sometimes possessing nape frills but not always, is a little variable in coloration. The Grey is the largest and lives in Northern Australia, both in the east and the west, and is greyish brown above with paler whitish tipping to the feathers and almost uniform grey below, the only ornamentation being a lilac nape frill, a little erectile. The female is greyer without the nape frill. It is worth notice that it has not yet been reported from New Guinea. Alongside in the Cape York Peninsula lives the smaller Fawn-breasted bird which occurs in eastern New Guinea. This is easily separated by its smaller size, its browner grey upper coloration more boldly marked with paler margins, and its yellowish fawn colour below, the throat streaked, and the nape frill missing. The female is similar in coloration. Apparently a rarer western New Guinea form is Lauterbach's, about which very little is yet known, still smaller and more yellowish below than the preceding without any nape frill, and the male with the head golden orange, the supposed female grey-headed. But the Spotted Bower Bird is the most numerous and best known, being found throughout Australia, but not seen in New Guinea. It is about the same size as the Fawn-breasted and shows geographic variation, some of the extreme forms appearing very distinct. The general coloration is dark brown above, boldly spotted with buff, a prominent nape frill, and the under-surface streaked and barred. In this species the adult female

appears to develop a nape frill so that we see a series from *cerviniventris* and *lauterbachii* without nape frill, *nuchalis* with nape frill in male only, and *maculata* with nape frill in both sexes. Both the New Guinea forms are reported to be non nape-frill bearing.

Four species are recognised in this series, and as each has been named as a distinct genus the characters will be given here and the differences indicated, so that their evaluation will be left to the individual worker. The group forms obviously a colour-series as the classification is guided by colour scheme. Had they been of different colour patterns they might not have been associated.

The genus was based on the Spotted bird, so that its characters are here given: the bill is short, very stout, deep, narrowly triangular, culmen well curved, tip slightly decurved, notched a little behind, lower edge of upper mandible a little curved, under mandible almost as deep as upper, interramal space broad triangular, less than half the length of the bill, gonys curved, a little ascending, nasal groove short, frontal feathers approaching but nostrils free, exposed as short orals; head flattened, ornamental nape frill present.

The wing has the primaries pointed, the first fairly long, about two-thirds the length of the third and fourth, which are longest and subequal, the second about equal to the fifth, the secondaries long, a little broader, and exceeding the innermost primary in length. The tail is long and straight, the feathers of medium breadth, tail coverts reaching nearly half

the length of the tail. The legs are stout, rather short, very boldly scuted; about eight scutes, in front, bilaminate behind; the toes strong, but rather short, claws rather long, middle toe longer than outer which exceeds inner, but hind toe and claw longer than middle toe and claw, hind claw stout. While the nape frill is usually a male character, in this species the female is developing it sometimes, if not always.

The species *nuchalis* is more uniform above, not spotted, but feathers margined, and grey rather than brown in general tone, and is larger, with a much stronger bill and larger feet, the wing formula slightly different, the first primary still longer, but otherwise of the same general structure; only the male shows a nape frill. The third, *cerviniventris*, is about the same size as the first, but does not

develop a nape frill in either sex, and it is interesting to note that this is the New Guinea eastern form only reaching into North Queensland. In western New Guinea another species has been found rarely, much more highly coloured, with yellow notable, and this, so far, is not known to grow a nape frill, but is easily recognisable as referable to this group.

The variations thus seen are worthy of note, as they may indicate the evolution of the nape frill through long residence in Australia, and this appears to be confirmed by the fact that the most widely spread form shows the female to be also developing a nape frill. Up to now, no great alteration in bower-building is known, although the choice of decorative articles varies, and the bower of the western New Guinea bird is reported to be without any decorations.

THE GREAT GREY BOWER BIRD

Plate xxxii, Figs. 1 and 2

The Great Grey Bower Bird is the largest of these birds with brown or grey general upper parts and sometimes spotted below. The majority of them carry a nape-band of lilac feathers of different hues and seem to form a little party of their own. This was the first one of the group to be described, and it was classed by structure alone with the Satin Bird, its coloration being very different. It was ushered into the scientific world without any real home, and it is now too late to find out its exact birthplace. When some specimens were received from North-Western Australia, it was concluded that it might have come from there, but later it was found to live also in North Queensland, which complicated the matter. Upon comparison the latter was seen to agree better with the original painting, so that until definite information is received North Queensland

may be regarded as the type locality. Port Essington was ruled out on account of its later settlement than the date of description (1830), but it is now known that there was a short-lived attempted settlement there in 1824.

The general upper coloration is ashy brown with paler tips, with a nape sub-crest of lilac rose feathers, the under-surface also ashy brown with a rather greyish tinge; bill, legs and eye brown. Nothing at all distinctive save the flash of colour at the nape.

This bird has been noted by most explorers of the far north-west, and the bowers were commonly reported. Probably Keartland's notes are as good as needed: "The peculiar notes of the Great Bower-bird were heard along the Fitzroy River, from Derby to the Margaret River. Soon after reaching the former river, in

November, I secured a young one, and on mentioning the matter to several gentlemen at the camp, they informed me that a pair had been taken from a nest by a black boy a few weeks previously. This species is very fond of bathing, and will roll in the water until its feathers are thoroughly soaked; most of the specimens were obtained at the horse trough near the well, where they came frequently to drink and bathe. They are very tame, and easily shot. Their chief food is the small black native fig, so common in North-Western Australia. These birds are seldom seen in company except at their bowers or playhouses, which are formed by spreading a layer of fine twigs for a space of about three feet, across which two parallel walls of twigs are constructed with their tops meeting so as to form an avenue. The walls of one I measured were three feet in length by fifteen inches in height. Through this bower, and all around the structure, large quantities of bleached bones, pieces of glass, quartz, tin and bright coloured feathers are scattered. The bowers are usually formed under the shelter of spreading bushes, but near the Margaret River one I saw was constructed inside an old native wurley. It is said that these birds lay about October, and that the nests are built in a *Bauhinia*, and sometimes in a *Melaleuca*. The breeding time was later ascertained to be influenced by the rainfall, nests having been found from September to December, as low as one foot from the ground, and also at six feet, both in *Bauhinia*."

Olive reported: "Is plentiful in the neighbourhood of the Katherine River, in the Northern Territory. I have seen between twenty and thirty feeding in a tree at the same time. They are shy yet inquisitive, and often would they hop on the ground or branches to within a yard or two of me if I kept quiet. Generally their bowers are built under the shade of trees,

or under small shrubs, out in the open, and near dead timber. At one place where these birds were common there were seven bowers within a space of fifty yards square, and one getting built which I watched from start to finish. Of the eight, there were only three of them in use; the others were old, although they looked as good as the new ones. The foundation of the new bower was made of sticks laid on the ground almost parallel to one another, to the thickness of about an inch, and then the sticks to form the walls of the bower were inserted in the crevices. The outer measurements of this bower were, roughly, eighteen inches in length and fourteen inches in breadth; across the inside it measured six inches at its widest part. The decorations were quartz crystals, land shells, and fruit. At another bower I found a revolver-cartridge, with a bullet in it, and some pieces of broken insulator caps. I carefully looked among the articles collected for nuggets of gold, as the birds would pick them up if there were any about. One bower was arched right over, being different to any I have ever seen. The nests are very roughly formed open structures, built throughout of twigs, averaging from about three to six inches in length, without any other lining. The nests are all built in small trees in ridgy country at an height varying from eight to twenty feet from the ground. I never found more than one egg in a nest, and never found a nest near the bower."

Day wrote from North Queensland: "Fairly common all the way from Charters Towers to Croydon and Normanton, and from the latter locality south and west to Cloncurry and on towards Winton. These birds had a perfect craze for bones. While camped on the Leichhardt River I used to shoot a number of pigeons for the pot. When eating them the Bowerbirds would watch me from the trees, and

the moment I threw the bones away the birds would descend to the ground, pick them up and carry them away to their bowers. Most of the bowers I examined had a quantity of small bones of mammals heaped up near the entrance, and around them as a rule a number of shells and a few coloured bits of stone. In one bower I found a very bright specimen of gold embedded in glistening white quartz, and when in the opal country I used frequently to find pieces of precious opal in and around them. The miners do not like these birds, as they pilfer any small bright articles lying about the camp to ornament their bowers, tin teaspoons, blades of penknives, buttons, horseshoe nails, etc."

This is the largest of these Bower Birds and has a nape frill only in the male. The bill is large, laterally compressed, not greatly expanded at the base and the culmen is semi-keeled, but all structural details otherwise normal. The head feathers are silvery grey, closely appressed, the bases brown, the nape frill of elongated narrow, closely-packed feathers, of a rose pink (it may be noted that the coloration of these nape frill feathers differs slightly in shade and the delicate shades are difficult to express in words); the upper-surface is ashy brown, each feather tipped with dirty white, giving a greyish appear-

ance as a whole; the under-surface clear grey with a slight brownish tinge; wing coverts marked as back, primaries brown with tips whitish, while the tail feathers are brown margined with whitish and with large whitish bar at end. Bill 27 mm., wing 170 mm., tail 140 mm., tarsus 40 mm.

The female is more uniform above, the tipping less marked and the grey more marked, the under-surface is also greyer and there is no nape frill. No distinction in size is apparent while the young resemble the female save that the juvenile brightness is present and the tipping clearer.

As above noted, the eastern and western forms were early distinguished and have always been recognised. Other forms may later be separated, as the Melville Island bird was called *C. n. melvillensis*, on account of its smaller and darker size being more like the Queensland one than the North-West, which is the palest, most uniform, of the three. The Western bird was called *C. n. oweni*, as the typical form was shown to be more like that of North Queensland than of the West.

It has been concluded to allow the present nomination, though if the type were re-found it might still prove to be the Port Essington or even the Melville Island bird.

THE FAWN BREASTED BOWER BIRD

Plate XXXIII, Figs. 2 and 3

This species does not seem ever to develop a coloured nape band so characteristic of all the other Australian birds, and it is a New Guinea bird which only enters North Queensland. This bird has a wide range in New Guinea, and as the other New Guinea form (or forms) does not possess a nape band either, it suggests that the nape band has been evolved within Australia. As it happens, this bird was

secured at Cape York before it was found in New Guinea. It is ashy brown above but darker than the Great Grey, but is fawn on the under-surface with brown markings on the chest.

The best notes are in connection with the North Queensland bird, and Thorpe noted: "While collecting on the Cape York Peninsula in 1867-8 I occasionally met with this bird in the immediate vicin-

ity of Somerset, and also near the mouth of the Jardine River, a distance of thirty miles from the extreme point of the Cape. The country there consists chiefly of wide belts of scrub, interspersed with open narrow stretches of sandy soil covered with tall grass and a few scattered bushes. I found two of their bowers in these open places, neither of them being far from the coast; they were formed of twigs, and averaged about two feet six inches in length, and the only decorations I saw about them were a few shells, pebbles and berries. These birds were by no means plentiful, extremely shy, and frequented chiefly a vine, growing luxuriantly in the scrub and known as the 'Native Grape.' This plant bears bunches of a small reddish black edible fruit, on which this bird chiefly subsists."

Bertie Jardine added: "These Bower Birds are permanent residents on the northern parts of the Cape York Peninsula, over which they are fairly distributed but are nowhere numerous. They frequent scrubs growing in soft sandy soil in the neighbourhood of the sea, and low brush bordering creeks and rivers. Usually they are shy and retiring, and are met with in pairs, but sometimes they may be seen in small companies from four to eight in number as they traverse the open parts of the forest in search of food. When flying from tree to tree or running along the ground, over which they pass with great rapidity, they occasionally utter a number of extraordinary notes in slow succession. Among the brushwood bordering the beautiful white sandy banks of the Jardine River, I have found many of their artfully constructed bowers or playing places. The walls of these bowers or avenues are formed externally of thin sticks, and are beautifully lined inside with very fine twigs. At both ends of entrances of these structures, for about two or three feet, are a number of pieces

of bleached bones, berries, leaves, shells and portions of the smaller crustacea, etc., some of these decorations being also placed inside the bower. The bowers average about three feet in length, eighteen inches to two feet in breadth, and from twelve to fifteen inches in height. Just after daybreak, and again about sunset, it is a very interesting sight to watch these birds playing about the bower. They may be seen running through and around the structure, with their primaries trailing along the ground, stopping now and again to pick up a bone, feather, shell or berry, while their companions are perched in the neighbouring trees uttering all the time their peculiar notes. Well beaten paths from three to five inches in width are made by the birds almost constantly running or chasing one another around the bowers."

As already noted, this bird was first found in Australia and has been well described and illustrated in the standard Australian works, so that the New Guinea bird is here described in detail. The bill is medium length, stout, culmen semi-keeled, a little laterally compressed, the tip hooked, posterior notching indistinct, the lower edge of the upper mandible a little wavy, lower mandible a little more basally expanded, the interramal space rounded, short feathered, gonys long, a little ascending, the nasal groove short, feathered, but leaving the oblique oval nostrils free and open.

The wing has the first primary medium more than half the length of the fifth, which is longest, the third, fourth and sixth little less, the seventh longer than the second, the first shorter than the secondaries, the primaries pointed, the secondaries rounded, a little broader, the inner (tertials) decreasing inwards. The tail long, square, the central pair a little shorter, the tail coverts less than half the length of the tail. The legs stout, short,

scuted in front, bilaminate behind, toes and claws long. The top of the head brownish grey with pale brown medial streaks, pronounced on forehead, back feathers darker with whitish shaft streaks, rump and upper tail coverts similar, very slight white tipping to feathers; wing coverts similar, some with fawnish tips, primaries and secondaries brown, the latter with paler edgings. Tail brown with faint ashy tips. The throat grey with brownish edges giving a streaked appearance, upper breast with brown increasing and dominating at sides; rest of under-surface pale yellowish buff to under tail coverts, thighs dark brownish grey; under wing coverts buffish yellow, inner lining of primaries pale yellowish brown. Bill black, eye brown, legs dark grey. The Australian bird has the streaks on the forehead more defined, less so on the back of the head, the back feathers show the median streaking less, but the feathers have large fawn tips as have the rump and upper tail coverts; the wing coverts and secondaries also show the tipping, while the wings have the edgings pale as also the ends; the tail feathers are brown with a terminal bar of pale fawnish; the throat is pale fawn with brownish streaks to upper breast, but less pronounced, especially so on sides, while the rest of the under-surface is deeper uniform buff. The measurements are similar, but,

as series, have not been examined from distant localities; bill 25 mm., wing 150 mm., tail 126 mm., tarsus 42 mm. The female measures a little less in all details.

A specimen was recorded from Sudest Island by De Vis, and this has been questioned in the latest list. The specimen is still available in the Queensland Museum, and compared with south-eastern mainland birds the head is more striped, the spotting on the end of the feathers of the back, secondaries, primaries and wing coverts is larger, the throat feathers are more heavily marked with brown, and the under-surface seems paler.

The nomination of the New Guinea form or forms is uncertain. Meyer named an egg from the Astrolabe Bay area, not even taken from a nest, as referable to a new species, *Chlamydodera recondita*, and such a name is really not worth consideration, but should be disregarded entirely, especially as another species lives in the same area. Then Mathews named *C. c. nova* from New Guinea only as being darker. The type locality of this must be the Port Moresby area, as all the birds available at that time came from there, whence it was reported as common.

It may be noted that Rand recorded from the Cyclops Mountains: "five sex ? ad., one sex ? nestling," without comment, noting wing measurement 143-159 mm., the last the longest wing length noted.

THE SPOTTED BOWER BIRD

Plate xxxiii, Figs. 1 and 4.

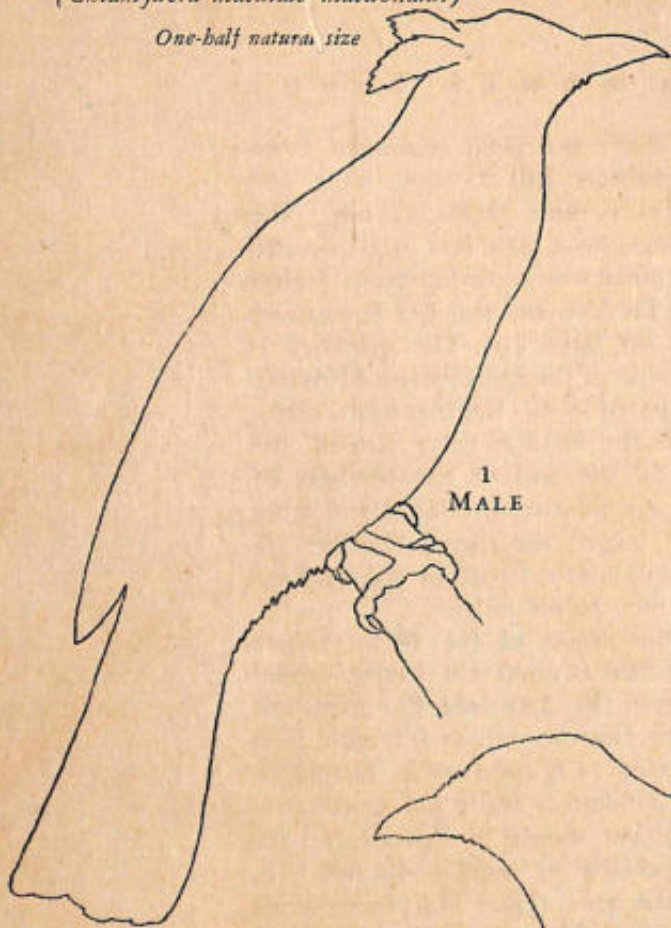
Gould was first attracted to the Australian bird fauna by the number of undescribed birds in the Museum of the Zoological Society of which he was caretaker. His first venture was a publication in parts of a Synopsis showing the heads and feet of the birds, including the new ones. This beautiful bird was given a new genus meaning beautiful neck, referring

to the lovely frill at the back of the neck. Unfortunately this name had been selected before, so it had to be changed to the one we still use. The bold marking of the back incited the specific name. A little later Gould decided to come to Australia, but it is possible that even in his most sanguine moments he did not visualise the wonderful results he achieved. Cer-

SPOTTED BOWER BIRD

(*Chlamydera macular: macdonaldi*)

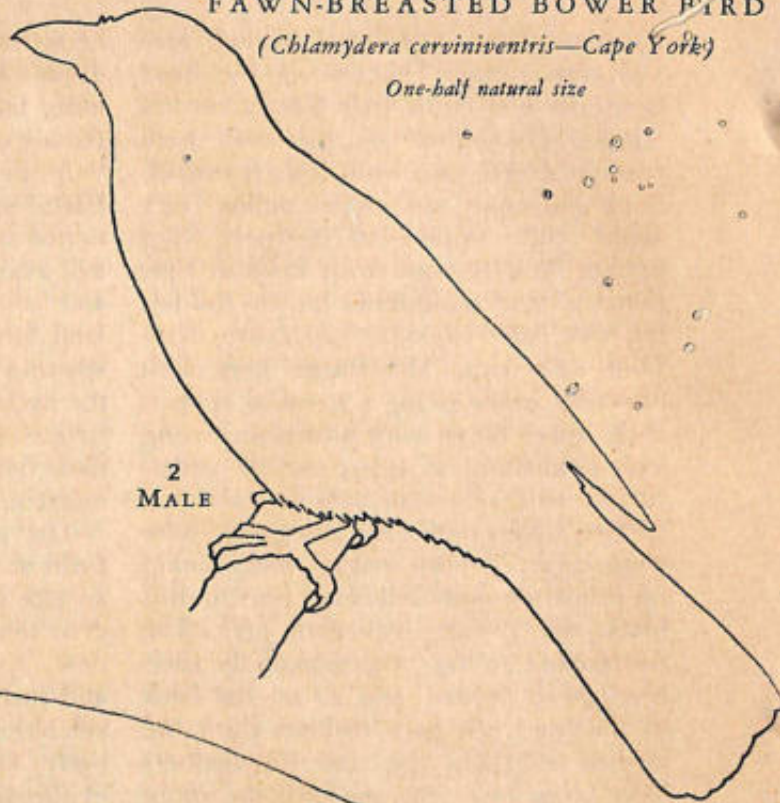
One-half natural size



FAWN-BREASTED BOWER BIRD

(*Chlamydera cerviniventris*—Cape York)

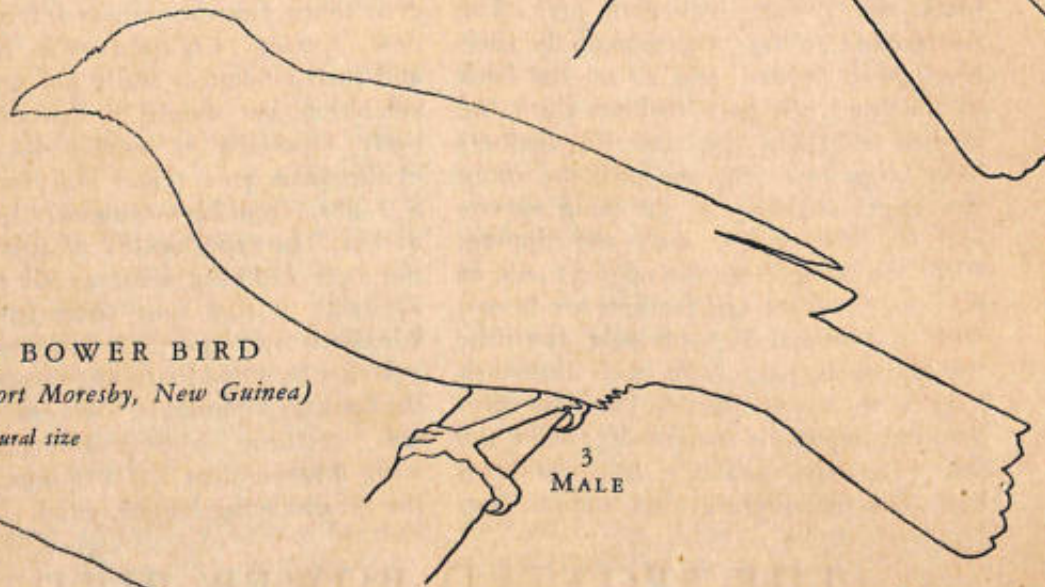
One-half natural size



FAWN-BREASTED BOWER BIRD

(*Chlamydera cerviniventris*—Port Moresby, New Guinea)

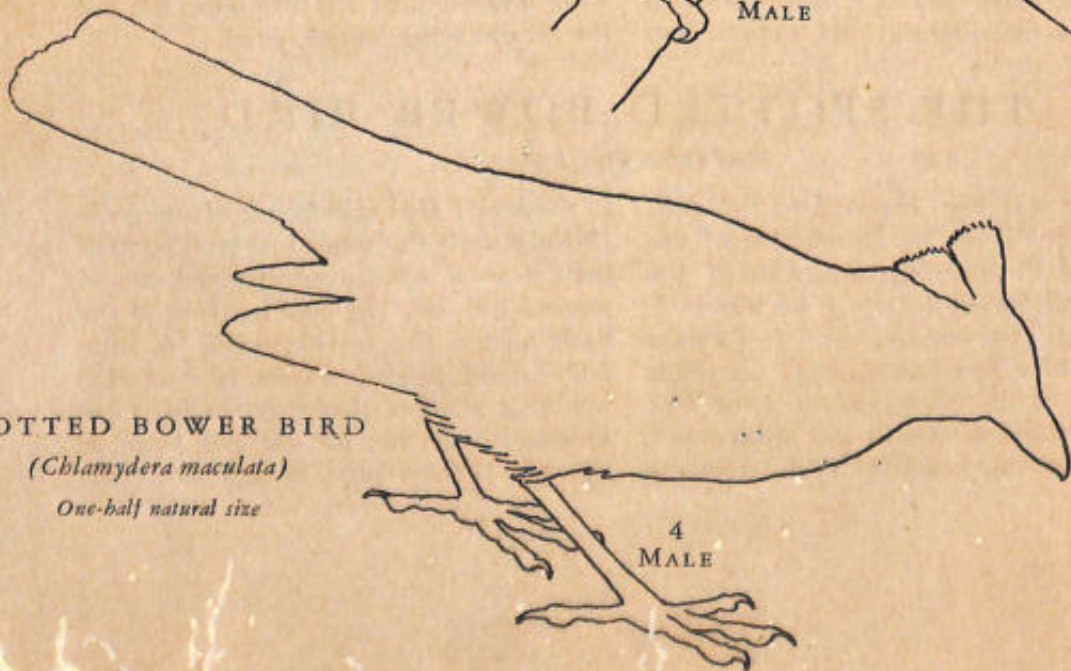
One-half natural size



SPOTTED BOWER BIRD

(*Chlamydera maculata*)

One-half natural size



tainly he could not anticipate the Bower-builders of which this is the most widely spread over Australia, but does not reach New Guinea.

It is a handsome bird with the elegant nape frill contrasting against the boldly spotted upper plumage, the spots being fawn on a dark brown background; the under-surface is also marked with streaks and bars of brown on a dull yellowish white ground. It is somewhat variable over its extensive range, as it is a sedentary home-loving bird. It was soon concluded that the original bird had come from New South Wales, so that when a darker form was found in Western Australia Gould had no hesitation in naming it as distinct. A little later, however, he described another species from Port Albany, North Queensland, but North pointed out that this form was not known from that locality, though either of the other two were, and that Gould's figure looked like that of a southern bird. This North Queensland record was still repeated in the *Syst. Av. Australasianarum*. In eastern Australia this Bower Bird does not approach the coastal areas, leaving those to the Satin Bird and the Regent Bird, and then it is found throughout the interior parts of Australia, being well-known from throughout Central Australia and into mid-western Australia. Generally speaking the central and western birds are darker and have been even separated specifically, but they seem to intergrade easily, in coloration and in range.

Since Gould's time a lot has been written about the eastern one, and only a few general notes can be here given. Grant reported: "A kangaroo-hunter, knowing that red has a powerful attraction for these birds, although none were seen at the time in the neighbourhood, threw a red flannel blanket he had in his tent

over the branch of a mulga tree. In less than an hour a male and a female alighted close to the blanket, and began to examine it in their inquisitive way. Many others on different parts of the run were soon seen by similar means of attraction." The note it utters when disturbed is a harsh and grating one, like that of the Satin Bird and the Indian Myna; when near its bower, or sitting quietly in a tree, a low plaintive noise is made, like the mewling of a kitten. As is now well known, this bird is an excellent mimic of the notes of other species, and of any sound it may hear. Nevertheless, North wrote: "I believe this kitten-like squeal is one of its natural notes, for I have also heard it uttered by a young Satin Bird I have in my possession, that had only left the nest a few weeks before, and had no opportunity, even if it were able, to acquire this feline call. The male imitates to perfection the liquid-like notes of the Crow-shrike, the shrill call of the Galah, the plaintive but clear note of the Peaceful Dove, and the whirring-like noise made by the Crested Bronze-wing Pigeon during flight. It, in fact, imitates the notes of any bird in the vicinity, and the barking of a dog, wood-chopping, the crack of a whip, any sound it may hear that is often repeated. Wild fruits, berries and insects, constitute the usual food of this species, but it is very destructive in gardens, eating nearly every kind of cultivated fruit and berries. In stomachs I have examined I have found portions of unripe tomatoes, grape skins, seeds and whole raisins; in others the stomachs were filled entirely with the heads, legs and elytra of coleopterous insects. In captivity it will eat almost anything."

The bower is profusely decorated with the bleached bones of mammals and birds, land and fresh water shells, pebbles, pieces of glass, berries, seeds, etc.; in the

centre are generally a few stones, berries, shells, or bits of glass. Metallic substances, too, possess a great attraction for these birds, and they will readily enter tents and houses in the more thinly settled districts to procure them. Scissors, knives, plated spoons and forks, thimbles, coins, etc., are frequently pilfered. A bower near Moree was described: "The walls were constructed entirely of spear-grass, on a slight foundation of very thin twigs. It measured eighteen inches in length, fourteen inches in breadth at the base, and twelve inches across the heads of the grass stalks; the height of the walls being twelve inches. The run was well trampled down and cleanly swept at either end and around the sides of the bower; and owing to the disposition of the decorations, which consisted of three neatly made and piled up heaps, was nearly six feet in length. A foot away from the entrance at one end was about a bucket full of glass; and at the other, two buckets full of bleached bones. In a direct line, six inches away from the heap of glass, was another same sized heap of bones, with which were intermingled a few nuts of the Grouie-tree. Just inside the entrance were some siliceous stones, and bits of coloured glass, and in the centre a few freshly picked berries. At another place four birds were seen, but it was impossible to tell how many assisted in the construction of the bower."

Many other similar accounts have been printed, but as the western bird has been specifically separated at times, an account recently published of a western bower is here reproduced for comparison. Angus Robinson wrote: "One gave, whilst perched in the tree above me, a very good imitation of the call of the Whistling Eagle. From my experience later, I believe that the imitation of the Eagles' notes is very common. I rarely saw the bird in numbers—generally one to six—although

I have seen up to sixteen drinking at a spring at the one time. The first bower was out in the open, and not two feet off the road; the second was situated in an Acacia thicket where I often watched a bird play. Although I have noted as many as six birds looking on I have only ever seen one at a time play in a bower. The play seems to consist of shifting the stones about—into the arch and out again. The bird keeps up a chattering noise all the time whilst playing. I found the Bower-birds one of the most inquisitive of birds. I noticed that if I stopped quite still a bird would sometimes come within two or three feet of me, peering this way, then that, in a fashion resembling the movements of a snake.

"The bower is generally placed under a shady bush, particularly a bush which comes down close to the ground and has dead branches touching the ground. It is never far from water—mostly springs or natural waters in the ranges—but I have seen birds build bowers close to wind-mills. Bowens might face in any direction. The arch is made of sticks and lined inside with long thin leaves like pine needles. The platforms of sticks—at both ends of the bower—vary in size and height one from the other. A platform is sometimes made as high as three inches above the ground. It is not always directly in line with the arch, but may come up to either end at an angle. The bottom of the arch is generally higher than the platform, although at times it is barely noticeable. The stones used for ornamentation are always of a greyish colour inclining to white and there are green berries, leaves, etc., in season. The birds build a new bower every two or three years. It is always close to the last structure—sometimes only two or three feet away—but they do not shift the stones used for playing purposes. At some of the springs one

sees a small heap of bleached stones in the vicinity of a bower in use which denotes the whereabouts of a past bower. There is a good deal of difference in the way the bowers are kept, some being very neat and others having a very unfinished appearance. The playing articles, besides being placed in the depression in the centre of the arch, may also be placed in a cleft in one of the walls, four or five inches up from the floor of the arch . . . I heard what I took to be the 'meow' of a cat and thought it strange to hear a cat in that locality. I heard the cry repeated a few times about twenty yards away; then a Bower-bird flew up close to the bower, mimicking the call of a Butcher-bird. After scrutinizing me he hopped into the bower and started preening, every now and then sticking his head over the top of the walls to have a look at me. When disturbed he uttered the cry of the Brown Hawk or Butcher-bird in a manner that suggested a threatening attitude. Whilst in the bower he hopped all the time, even when turning. Once or twice he gave the cry of the Blue-winged Kookaburra. All these imitations were perfect, but, with the exception of the call of the Butcher-bird, they appeared to be in a weaker voice. There were two Butcher-birds calling occasionally and I could hardly tell the imitation from the real cry. Later I visited this bower again. One bird came to the bower and was soon joined by two others—*young birds I should think*. They all had pink napes. They did not stop about the bower for long. These Bower-birds are noted for their love of the garden figs for which they make trips to the homestead gardens. They will mimic almost anything, but the 'voices' of cats, dogs and various bird calls are the usual notes imitated. I have not found a nest at any time, but I saw two fully-fledged young sitting side by side on March 12.

"The measurements of four bowers investigated are as follows:

	1	2	3	4
Length				
of bower	15 in.	14 in.	14 in.	14 in.
Width				
of bower	6	7	7	5
Height of arch inside	6-9	9-12	9	8-10
Depth of depression in arch	1½	none	½	1
Height of arch off platform	2	1	½	1-2
Distance of platform from bower	18	12-18	24	18

"In Central Australia these birds are fairly common but are very shy, and although their notes were frequently heard amongst the foliage of the fig trees, they kept well out of sight. However, in periods of drought, they would come to the water buckets under the verandah to drink, and became quite fearless in the presence of persons sitting close by. The bowers are usually built near, or under the shelter of a low spreading bush so as to escape the rays of the tropical sun. The bowers were chiefly decorated with land shells, pieces of bone, different berries according to the season, and a few bright coloured feathers. After the advent of civilised man, pieces of glass, odd nails, bits of bright tin, were found intermingled with the natural ornaments. The birds make the peculiar single note familiar in other members of the genus—half cry—half hiss."

Carter, when he reported upon the birds from Point Cloates (Carter Ibis 1921 p. 75 Jan.), had secured females and males near old nests, but not in breeding condition. These had been feeding on small round berries and leaves off some bush and "a careful search in the vicinity failed to find any bowers or playgrounds, and none were seen either in that gully which

we followed to its head, or any of the other numerous ones that were examined on that and the following days." Birds were also seen in fig trees and Carter concluded that they fed largely on wild figs. "Their flight is straight, with rapid strokes of the wings, and resembles that of Magpies (*Gymnorhina*); they look large when flying." He noted that Whitlock had stated "that in the East Murchison form the nuchal band is much smaller in the female bird than in the male." That is certainly not always the case in the Point Cloates bird. The nuchal bands of all the birds obtained are mostly of vivid pink colour, but they all contain a few bluish purple feathers scattered in with the pink ones. The markings, which appear to be black on the edges of the tawny spots on the crown of the head, show a distinct green when held at a certain angle. Point Cloates is about 480 miles north-west of the East Murchison locality. Attention may be drawn to the decorations named in the usage of this bird, whitish bones, dead land shells, stones, berries, seeds and more recently glass, pieces of shining metals. Psychoanalysis of the ornamental urge of the Satin Bird has produced a conclusion that its preference for green and blue is due to the feminine coloration, being green with blue eyes. It will be amusing to read a similar report upon this bird's preferences, as at first sight none of the objects can be easily traced to the female coloration, and there is also the tendency to red in the bird's coloration which it does not use, perhaps antipathy would be the better word, even as white seems repugnant to the Satin Bird.

The extensive range of this species seems to be continuous across the continent so that only one species can be maintained, although the extremes are well marked. However, probably many isolated subspecies may be separated. The

eastern typical form is here figured and described. Top of head silky brown with broad red tips making a mottled appearance, the back of head with pink erectile horseshoe-shaped frill, nape grey, back dark brown, each feather with roundish pale red brown spot, the lower back and upper tail coverts with larger spots edged again with black, wing coverts and primaries brown with large fawn red tips, larger on the coverts; secondaries with red edges and broad tips, tertials darker; throat brownish with black streaking reaching on to upper breast, lower breast and mid-abdomen uniform yellowish, sides grey with yellowish tinge faintly barred with brown, barring more pronounced on flanks and thighs, under tail coverts salmon with white tips, under wing coverts fawnish with a few brown speckles on small outer feathers, inner wing lining yellowish. Bill black, eye brown, legs olive green, bill 23 mm., wing 147 mm., tail 112 mm., tarsus 40 mm.

The female is similar and although it has been reported as lacking the nape frill, it appears certain that females do show this at times and in different places, but whether always or whether it is a senile sign is not yet known. In no other species, however, has any female been recorded showing a nape frill at any time or place.

A Central Australian bird is also figured and here described: "The head is more silky; the back blacker with the spots deeper, smaller, more distinct; the throat black with median white spots with black streak in centre, the breast and rest of under-surface uniform dirty greenish yellow medially, the sides brownish with faint barring only on flanks and thighs, under tail coverts paler, under wing coverts paler fawn, inner wing lining deeper. The bill, eye and legs coloration similar to preceding, and measurements do not differ appreciably.

The subspecies named are *C. occipitalis* Gould from "Port Albany, North Queensland," error for New South Wales, and therefore a synonym of the typical subspecies, *C. maculata maculata*. The western form was named *C. guttata* and two variations of that have been named; the typical *guttata* came from the Gascoyne River, and the East Murchison bird was named *C. m. subguttata* by Mathews on account of its much paler upper and lower coloration and especially in its grey head. At the same time the most southern of the eastern type was named *C. m. clelandi* from South Australia (Murray River flats), differing in its smaller bill, its paler nuchal crest and its redder abdomen. Then the Central Australian form was separated as *C. m. macdonaldi* by Mathews from the "Macdonald" (Macdonnell) Ranges as being darker also with

a small bill compared with *C. m. subguttata*; and the interior Queensland form also by Mathews, *C. m. sedani*, compared with the typical bird *C. m. maculata* as being much lighter, and with the frill of the neck more pink. When Carter found the bird at North-West Cape, mid-west Australia, it was also named as being separable from the East Murchison *C. m. subguttata* as having the yellow on the breast and abdomen much deeper and richer in colour, the flank markings bolder and darker and the throat and upper breast less dark markings. The female has a large nuchal frill. It was named *C. m. nova* by Mathews but renamed *C. m. carteri* by Carter and Mathews to avoid clashing with the subspecies *nova* of the *nuchalis* species. Probably more subspecies will be named as the variations seen seem to be locally constant.

LAUTERBACH'S BOWER BIRD

Plate xxvii, Fig. 5, and Plate xxviii, Fig. 4

This is the only one of this series which is restricted to New Guinea, the other New Guinea species being represented in Northern Australia. It was described from the valley of the Ramu River in Northern New Guinea thus: "Crown of head and cheeks golden orange; nape yellowish olive brown; feathers of the upper-surface, upper tail coverts, and lesser wing coverts olive brown, with yellowish tips; median and greater wing coverts olive brown with whitish tips; throat pale yellow streaked with brown; each feather with a pale yellow shaft stripe and brown margins, the centre of the throat nearly uniform pale yellow. Under-surface and under tail coverts pale chrome yellow, the flank feathers closely banded with pale brown; under wing coverts pale yellow, the longer ones with pale brownish tips; tail feathers dark olive brown, with yellowish

outer margins and broad white inner margins and tips; primaries dark brown, with pale yellowish outer margins and broader bright yellow inner margins, the shafts below yellow; the secondaries with whitish tips; bill black; iris brown; feet grey; length 285 mm., wing 130 mm., tail 110 mm., bill 22 mm., tarsus 40 mm." Nothing more was heard of this species for nearly twenty years when Ogilvie-Grant reported a female collected by the British Ornithologists' Union Expedition to New Guinea. He wrote: "This specimen (from the Kamura River, southwest New Guinea) is unlike any of the allied forms; it has the underside washed with yellow and is almost certainly the female of the Orange-crowned Bowerbird, *C. lauterbachi*, of which the male was described and figured by Dr. Reichenow, from a unique specimen procured

in North-East New Guinea. Our specimen differs chiefly from the figure given in having the sides of the head and crown greyish brown tinged with olive like the rest of the upper parts and in being less yellow on the under parts. Its measurements are likewise smaller. Total length in the flesh 288 mm., wing 122 mm., tail 100 mm., tarsus 37 mm. The male type was procured on the Jagei River, a tributary of the Ramu River, probably at no great elevation. Though the two specimens were obtained in localities so far apart, there seems to be no reason why they should not be male and female of the same species. The female obtained by the B.O.U. Expedition possesses many characteristics in common with the male type of *C. lauterbachii*, and the differences in plumage are just what one might expect to find in the female of that species."

Years again elapsed without any further information when Shaw Mayer collected a pair in the Weyland Mountains, and these allowed Rothschild to differentiate the western birds as *C. lauterbachii uniformis*, pointing out that the male differed in having "the head cheeks and hind neck being yellowish olive brown, *not* fiery orange on the head and cheeks and golden olive on hind neck; rest of upper side deeper brown with more dusky olive edges and tips, *not* brown edged distinctly with golden olive; rump more distinctly olive, *not* brown edged with gold; chin throat and upper breast less bright yellow and feathers more widely edged with olive brown. Rest of under side bright golden yellow. Wing 129 mm., bill 24

mm., tarsus 34 mm., tail 115 mm. Female similar but slightly dusker above and more buff yellow below. Wing 124 mm., bill black, eye brown, feet grey. The two birds were secured at a bower which is like that of the Satin Bird of Queensland, but without any decorations. The construction and courtship in the bower show this is an adult pair, confirmed by dissection."

Through the assistance of Mr. N. B. Kinnear, now Director of the British Museum (Natural History), a painting of the Kamura River specimen was made by Miss R. G. Talbot-Kelly, and is here reproduced. This painting suggests that it represents another subspecies, judging from Rothschild's description of the coloration.

At the time the preceding was written only four birds were known as above recorded from distances well apart. While this book was in the press Captain Blood has continued his researches in the Mt. Hagen district, and it is found that this species is a comparatively common resident in that area. Mr. Norman Chaffer, the well-known Australian ornithologist, visited New Guinea as a guest of Captain Blood and photographed the nest and bower and brought back a specimen. This, being a female, does not agree with the original male, nor with the female of *uniformis*, which is said to be like the bird figured under that name.

The nest and egg are typical of *Chlamydera*, but the bower is somewhat unlike any other, being formed in a rude cross. A full account will be published by Mr. Chaffer in the "Emu" at an early date.

CHECK-LIST
OF THE BIRDS OF PARADISE
AND BOWER BIRDS

A complete Check-List, with all the principal references accurately determined, has been published in the Australian Zoologist, Vol. XI, pp. 161-189, Feb. 11 1948, to which students are referred. Here is presented a skeleton list of species for general use:—

Family PARADISEIDAE. BIRDS OF PARADISE.

Subfamily PAROTIINAE. RIFLE BIRDS AND THEIR ALLIES.

Genus PTILORIS Swainson 1825.

Ptiloris victoriae Gould 1850.

Ptiloris paradiseus Swainson 1825.

Genus CRASPEDOPHORA Gray 1840.

Craspedophora magnifica Vieillot 1819.

Craspedophora magnifica intercedens Sharpe 1882.

Craspedophora magnifica claudia Mathews 1917.

Genus LOPHORINA Vieillot 1816.

Lophorina superba Forster 1781.

Lophorina superba minor Ramsay 1885.

Lophorina superba latipennis Rothschild 1907.

Lophorina superba feminina Ogilvie-Grant 1915.

Lophorina superba niedda Mayr 1930.

Lophorina superba (sphinx Neumann 1932).

Lophorina superba pseudoparotia Stresemann 1934.

Lophorina superba addenda Iredale 1948.

Genus PAROTIA Vieillot 1816.

Parotia sefilata Forster 1781.

Parotia lawesi Ramsay 1885.

Parotia lawesi helenae De Vis 1897.

Parotia lawesi exhibita Iredale 1948.

Parotia wabnesi Rothschild 1906.

Parotia duivenbodei Rothschild 1900.

Parotia carolae Meyer 1894.

Parotia carolae (berlepschi Kleinschmidt 1897).

Parotia carolae meeki Rothschild 1910.

Parotia carolae chrysenia Stresemann 1934.

Genus SELEUCIDIS Lesson 1834.

Seleucidis melanoleucus Daudin 1800.

Seleucidis melanoleucus auripennis Schlüter 1911.

- Genus HETEROPTILORHIS Sharpe 1898.
Heteroptilorhis mantoui Oustalet 1891.
- Genus PARYPHEPHORUS Meyer 1890.
Paryphephorus duivenbodei Meyer 1890.
- Genus JANTHOTHORAX Büttikofer 1895.
Janthothorax bensbachi Büttikofer 1895.
- Genus QUESOPARENS Iredale 1948.
Quesoparens mirabilis Reichenow 1901.
- Genus LAMPROTHORAX Meyer 1894.
Lamprothorax wilhelminae Meyer 1894.
- Genus PARADIGALLA Lesson 1835.
Paradigalla carunculata Lesson 1835.
Paradigalla brevicauda Rothschild and Hartert 1911.
Paradigalla brevicauda intermedia Ogilvie-Grant 1913.
- Genus MACGREGORIA De Vis 1897.
Macgregoria pulchra De Vis 1897.
Macgregoria pulchra carolinae Junge 1939.

Subfamily ASTRAPIINAE. LONG TAILS.

- Genus ASTRAPIA Vieillot 1816.
Astrapia nigra Gmelin 1788.
Astrapia rothschildi Foerster 1906.
- Genus CALASTRAPIA Sharpe 1898.
Calastrapia splendidissima Rothschild 1895.
Calastrapia splendidissima helios Mayr 1936.
- Genus ASTRARCHIA Finsch and Meyer 1885.
Astrarchia stephaniae Finsch and Meyer 1885.
Astrarchia stephaniae feminina Neumann 1922.
Astrarchia stephaniae ducalis Mayr 1931.
Astrarchia barnesi Iredale 1948.
- Genus TAENIAPARADISEA Kinghorn 1939.
Taeniaparadisea mayeri Stonor 1939.
- Genus ASTRAPIMAGHUS Mayr 1941.
Astrapimachus ellioti Elliot 1873.
Astrapimachus astrapioides Rothschild 1897.
- Genus LOBORHAMPHUS Rothschild 1901.
Loborhamphus nobilis Rothschild 1901.
- Genus LOBOPTILORIS Iredale 1948.
Loboptiloris ptilorhis Sharpe 1908.
- Genus PSEUDASTRAPIA Rothschild 1907.
Pseudastrapia lobata Rothschild 1907.

Subfamily EPIMACHINAE. SICKLE BILLS.

Genus EPIMACHUS Cuvier 1816.

Epimachus fastuosus Hermann 1783.

Epimachus fastuosus atratus Rothschild and Hartert 1911.

Epimachus fastuosus stresemanni Hartert 1930.

Epimachus meyeri Finsch and Meyer 1885.

Epimachus meyeri albicans Oort 1915.

Genus DREPANORNIS Sclater 1873.

Drepanornis albertisi Sclater 1873.

Drepanornis albertisi cervinicauda Sclater 1884.

Drepanornis albertisi geisleri Meyer 1893.

Drepanornis albertisi inversa H., P., Rothschild and Stresemann
1936.

Genus DREPANANAX Sharpe 1894.

Drepananax bruyni Oustalet 1880.

Subfamily CICINNURINAE. KING BIRDS.

Genus CICINNURUS Vieillot 1816.

Cicinnurus regius Linné 1758.

Cicinnurus regius rex Scopoli 1786.

Cicinnurus regius coccineifrons Rothschild and Hartert 1896.

Cicinnurus regius claudii Ogilvie-Grant 1915.

Cicinnurus regius gymnorhynchus Stresemann 1922.

Cicinnurus regius similis Stresemann 1922.

Cicinnurus regius cryptorhynchus Stresemann 1922.

Cicinnurus lyogyrus Currie 1900.

Genus DIPHYLLODES Lesson 1834.

Diphyllodes magnifica Forster 1786.

Diphyllodes magnifica chrysoptera Elliot 1873.

Diphyllodes magnifica hunsteini Finsch and Meyer 1885

Diphyllodes magnifica septentrionalis Meyer 1892.

Diphyllodes magnifica intermedia Hartert 1930.

Diphyllodes magnifica extra Iredale 1948.

Genus RHIPIDORNIS Salvadori 1876.

Rhipidornis gulielmi III Meyer 1875.

Genus SCHLEGELIA Bernstein 1864.

Schlegelia wilsonii Cassin 1850.

Subfamily PARADISEINAE. TRUE BIRDS OF PARADISE.

Genus PARADISEA Linné 1758.

Paradisea apoda Linné 1758.

Paradisea novaeguineae D'Albertis and Salvadori 1879.

Paradisea augustae victoriae Cabanis 1880.

Paradisea raggiana Sclater 1873.

Paradisea decora Salvin and Godman 1883.

Paradisea minor Shaw 1809.

Paradisea minor finschi Finsch and Meyer 1885.

Paradisea minor jomiensis Rothschild 1897.

Paradisea minor pulchra Mayr and Schauensee 1939.

Paradisea maria Reichenow 1894.

Paradisea bloodi Iredale 1948.

Genus NEOPARADISEA Oort 1906.

Neoparadisea ruysi Oort 1906.

Genus URANORNIS Salvadori 1876.

Uranornis ruber Daudin 1800.

Genus TRICHOPARADISEA Meyer 1893.

Trichoparadisea guilielmi Cabanis 1888.

Genus PARADISORNIS Finsch and Meyer 1885.

Paradisornis rudolphi Finsch and Meyer 1885.

Subfamily MANUCODIINAE. MANUCODES AND PARADISE-CROWS.

Genus LYCOCORAX Bonaparte 1853.

Lycocorax pyrrhopterus Bonaparte 1851.

Genus MANUCODIA Boddaert 1783.

Manucodia chalybata Forster 1781.

Manucodia chalybata jobiensis Salvadori 1875.

Manucodia chalybata orientalis Salvadori 1896.

Manucodia atra Lesson and Garnot 1830.

Manucodia atra altera Rothschild and Hartert 1903.

Manucodia atra subaltera Rothschild and Hartert 1929.

Genus EUCORAX Sharpe 1894.

Eucorax comrii Sclater 1876.

Eucorax comrii trobriandi Mayr 1936.

Genus PHONYGAMMUS Lesson and Garnot 1826.

Phonygammus keraudrenii Lesson and Garnot 1826.

Phonygammus keraudrenii gouldii Gray 1859.

Phonygammus keraudrenii jamesii Sharpe 1877.

Phonygammus keraudrenii hunsteini Sharpe 1882.

Families ? . FALSE BIRDS OF PARADISE.

- Genus PTERIDOPHORA Meyer 1894.
Pteridophora alberti Meyer 1894.
Pteridophora alberti burgersi Rothschild 1931.
- Genus LORIA Salvadori 1894.
Loria loriae Salvadori 1894.
Loria loriae amethystina Stresemann 1934.
Loria loriae inexpectata Junge 1939.
- Genus LOBOPARADISEA Rothschild 1896.
Loboparadisea sericea Rothschild 1896.
Loboparadisea sericea aurora Mayr 1930.
- Genus SEMIOPTERA Gray 1859.
Semioptera wallacii Gray 1859.
Semioptera wallacii halmaberae Salvadori 1881.

Family PTILONORHYNCHIDAE. BOWER-BIRDS.

Subfamily SERICULINAE. ANOMALOUS BOWER-BIRDS.

- Genus SERICULUS Swainson 1825.
Sericulus chrysocephalus Lewin 1808.
- Genus XANTHOMELUS Bonaparte 1854.
Xanthomelus aureus Linné 1758.
Xanthomelus ardens D'Albertis and Salvadori 1879.
Xanthomelus bakeri Chapin 1929.
- Genus CNEMOPHILUS De Vis 1890.
Cnemophilus macgregorii De Vis 1890.
Cnemophilus macgregorii sanguineus Iredale 1948.

Subfamily AMBLYORNITHINAE. GARDENER BOWER-BIRDS.

- Genus AMBLYORNIS Elliot 1872.
Amblyornis inornatus Schlegel 1871.
Amblyornis macgregoriae De Vis 1890.
Amblyornis macgregoriae germanus Rothschild 1910.
Amblyornis macgregoriae mayri Hartert 1930.
Amblyornis subalaris Sharpe 1884.
Amblyornis flavifrons Rothschild 1895.
- Genus PRIONODURA De Vis 1883.
Prionodura newtoniana De Vis 1883.
- Genus ARCHBOLDIA Rand 1940.
Archboldia papuensis Rand 1940.

Subfamily AILUROEDINAE. CAT-BIRDS.

Genus AILUROEDUS Cabanis 1851.

- Ailuroedus crassirostris* Paykull 1815.
Ailuroedus crassirostris blaauwi Mathews 1912.
Ailuroedus melanotis Gray 1858.
Ailuroedus melanotis arfakianus Meyer 1874.
Ailuroedus melanotis maculosus Ramsay 1875.
Ailuroedus melanotis melanocephalus Ramsay 1883.
Ailuroedus melanotis jobiensis Rothschild 1895.
Ailuroedus melanotis guttaticollis Stresemann 1922.
Ailuroedus melanotis astigmaticus Mayr 1931.
Ailuroedus melanotis facialis Mayr 1936.
Ailuroedus melanotis misoliensis Mayr and Schauensee 1939.
Ailuroedus buccoides Temminck and Laugier 1835.
Ailuroedus buccoides stonii Sharpe 1876.
Ailuroedus buccoides geislerorum Meyer 1891.
Ailuroedus buccoides oorti Rothschild and Hartert 1913.

Genus SCENOPOEETES Coues 1891.

- Scenopoeetes dentirostris* Ramsay 1876.

Subfamily PTILONORHYNCHINAE. SATIN BOWER-BIRDS.

Genus PTILONORHYNCHUS Kuhl 1820.

- Ptilonorhynchus violaceus* Vieillot 1816.
Ptilonorhynchus violaceus minor Campbell 1912.
Ptilonorhynchus rawnsleyi Diggles 1868.

Subfamily CHLAMYDERINAE. TRUE BOWER-BIRDS.

Genus CHLAMYDERA Gould 1837.

- Chlamydera nuchalis* Jardine and Selby 1830.
Chlamydera nuchalis oweni Mathews 1912.
Chlamydera nuchalis melvillensis Mathews 1912.
Chlamydera cerviniventris Gould 1850.
Chlamydera cerviniventris nova Mathews 1915.
Chlamydera maculata Gould 1837.
Chlamydera maculata guttata Gould 1862.
Chlamydera maculata clelandi Mathews 1912.
Chlamydera maculata macdonaldi Mathews 1913.
Chlamydera maculata sedani Mathews 1913.
Chlamydera lauterbachii Reichenow 1897.
Chlamydera lauterbachii uniformis Rothschild 1931.

BIBLIOGRAPHY

* Hereafter follows a list of the principal writers and collectors associated with the history of the Birds of Paradise and Bower Birds.

ANCIENT WRITERS. Almost every writer on birds or general natural history from the first discovery until the days of systematic work, following Linne, mentioned Birds of Paradise, but the majority were copyists, who however used imagination at times.

Chronologically may be cited: Pigafetti and Maximilian (1522/3), Cardanus (1551), Belon (1555), Gesner (1555), Scaliger (1566), Acosta (1590), Linschoten (1590/1), Aldrovandus (1599), Clusius (1605), Calceolarius (1622), Nieremberg (1635), Marcgrave (1648), Jonston (1650), Hernandez (1651), Bontius (1658), Charleton (1668), Willughby (1676/8), Olearius (1682), Ray (1713), Bradley (1721), Seba (1734), Klein (1750/60), and Brisson (1760). Some of these will be more particularly mentioned hereafter.

ACOSTA, JOS. "The Naturall and Morall Historie of the East and West Indies". English translation issued in 1604, original in Spanish published in 1590, "Historia natural y moral de las Indias", deals with America, and only mentions East Indies comparatively, but a stray reference to Birds of Paradise has been often quoted.

ALBERTIS, L. M. D', also D'Albertis. Italian traveller who explored parts of New Guinea in the seventies of the last century. His finds were described by Salvadori, and included in D'Albertis' work, "New Guinea. What I did and what I saw. 1880."

ALDROVANDI, U. "Ornithologiae. 3 Vols. 1599-1603." As all these works were written in Latin, this author is commonly known as Aldrovandus. An author of great standing, who disbelieved Pigafetti, and his disbelief was followed by many, though contradicted often, as by Willughby.

ARCHBOLD, R. A modern American who has financed and led well-equipped expeditions to New Guinea on behalf of the American Museum of Natural History. Much very valuable information has accrued from the scientific reports published in the scientific periodicals associated with the Museum, the collections of birds being worked out by Mayr and Rand, the latter a member of the expeditions.

ARMIT, W. E. Accompanied Macgregor and with Guise made a wonderful collection at Mt. Maneao; apparently Armit was the one more interested in birds.

BECCARI, O. Italian collector in the 1870's, who added much to our knowledge of living Birds of Paradise and Bower Birds. His collections were worked out by Salvadori, and used in the preparation of his great work on the birds of the New Guinea area.

BECK, ROLLO. A well-known American bird collector, mainly of seabirds, who, on a business holiday to New Guinea 1928-9, discovered a new Bower Bird.

BELON, P. "L'Histoire de la nature des Oyseaux", 1555. Often referred to especially as to his account of feathers worn by the Janisaries, which appear to have been Bird-of-Paradise plumes.

BENSBACH, J. Dutch resident at Ternate, who was interested when the plume-birds were passing through and picked out apparently peculiar specimens for Museum purposes.

BERNSTEIN, H. A. Dutch collector in the East Indies who collected Birds of Paradise in New Guinea, and forwarded to the Leyden Museum where Schlegel listed them in his Catalogues, in 1863-5, the lastnamed being the year Bernstein died.

BLOOD, N. B. Modern Australian who has made good collections of Birds of Paradise and to whom this work owes its inception.

BODDAERT, M. Prepared an Index to the Planches Enluminees, giving Latin scientific names to many of the plates not previously systematically named, including the Birds of Paradise. "Table des Planches Enluminees d'histoire naturelle de M. D'Aubenton. 1783." A very rare tract, which was, however, reprinted by the Willughby Society in 1874, so commonly available.

BONAPARTE, Prince L. Famous European ornithologist whose only essay into the Birds of Paradise resulted in chaos. The story is related under *Schlegelia wilsonii*. Apparently he was not much interested in this group.

BONTIUS, J. "Hist. nat. & med. Indiae Orientalis" (1658), in which the footless fantasy was definitely refuted and it was stated that they killed very small birds, a fact not really acknowledged for almost two hundred years afterward.

BROADBENT, Kendal. Australian collector, one of the first to collect in southern New Guinea.

BRISSON, M. J. The greatest ornithologist of his time, issuing "Ornithologia" in six large illustrated volumes in 1760. Though only listing two kinds, gave a very good compilation of the previous commentators, with remarks on the validity or otherwise of the forms distinguished. Indispensable book of reference.

BRUIJN, A. A. Dutch collector, whose name was written Bruyn by French workers, and apparently his birds passed through Bensbach's hands, as one was named *bruyni* by Oustalet as received from Bensbach.

BUFFON, G. L. L. DE. "Histoire Naturelle", issued in 44 volumes between 1749-1804, the volumes on Birds (nine) being jointly written with Montbeillard, between 1770 and 1783. Numerous editions in many languages were later issued, with numerous additions and even supplementary volumes.

BULLOCK, W. In his Museum about 1815 included the best show of Birds of Paradise at the time. See Austr. Zoologist Vol. XI pp. 233-237, pls xvi-xviii, Feb. 1948 for an account of this very remarkable naturalist.

BURGERS, Dr. German collector in the Schraderberg, New Guinea, whose collections were reported upon by Stresemann (q.v.) 1923, who gave an excellent review of Paradise Birds technically.

BUTTIKOFER, J. Dutch naturalist who collected in Dutch N.W. Borneo and later was attached to the Leyden Museum and named some Birds of Paradise.

CABANIS, J. L. Director of the Berlin Museum, the founder and first editor of the Journal fur Ornithologie. He named Birds of Paradise, though only in the course of routine.

CASSIN, J. American ornithologist who described the much illused Bare-headed Little King, sent by Wilson, after whom he named it, and it is often called Wilson's Bird of Paradise.

CHAPIN, J. Modern American ornithologist who has specialised in African Birds, but to whom fell the lot of describing the new Bower Bird discovered by Rollo Beck in 1929.

CLUSIUS, C. Latinised form of L'Ecluse, whose work "C. Clusii . . . Exoticorum libri decem", issued in 1605, included faithful accounts of the Birds of Paradise brought to Holland, e.g., the King Bird, which he saw there in 1603.

COMRIE, SURGEON, whose only notice is that he collected one of the finest birds, the Curl-

crested Manucode, apparently by accident, and which was named after him.

CURRIE, J. American ornithologist who named a species of King Bird, which has been under suspicion, but it is still possible that it will become an important member of the group.

CUVIER, F. G. Great French naturalist and teacher whose work "Le Règne Animal", issued first in 1816, with a second edition in 1829, is one of the best known of all natural history works, being issued with additions from time to time in France, Germany, Britain, etc. Introduced the genus *Epimachus*, but did not worry about specific names (of little consequence to his great mind).

D'ALBERTIS. See Albertis.

DAUBENTON, E. L. Issued an edition of Buffon's Natural History of Birds in folio with 973 large coloured plates of birds, with 35 plates of insects, better known as the "Planches Enluminées". These had no scientific names, so Boddaert provided an Index, and many other later workers also gave scientific names to the birds figured.

DAUDIN, F. M. Issued a "Traité d'Ornithologie" in 1800, in which the Red Bird of Paradise was first described. Began the Dict. Sci. Nat., but only six volumes appeared before he died in 1804.

DE VIS, C. W. Curator of the Queensland Museum, to whom fell the task of determining the wonderful bird collections made by Macgregor and his assistants. Though not a professed ornithologist, he made an excellent job of this difficult problem, much better than has been allowed by some extra-limital "ornithologists", and he deserves great credit.

DIGGLES, S. Australian ornithologist who in his Ornithology of Australia described and figured the mysterious *Ptilonorhynchus rawnsleyi*. See Austral Avian Record Vol. III pp. 98-108 and portrait 1917 for account of Diggles. Rawnsley was a local (Brisbane) naturalist who collected the specimen.

DUIVENBODE, C. W. R. van Renesse van. Father and son, in business at Ternate, brought to the notice of ornithologists strange birds going through their hands, and after whom some species were named. A parrot was dedicated to the father and two strange Birds of Paradise to the son.

EDWARDS, G. Published "A Natural History of Birds" (1743-51) which included "Paradisea aurea", "the Golden Bird of Paradise", which Linné legalised as "*Coracias aurea*", now referred to the Bower Birds as the Golden Bird.

ELLIOT, D. G. Great American naturalist who issued the first modern "Monograph of Paradise Birds and Bower Birds", in 1873, with magnificent coloured plates in folio size. This was followed by Sharpe's Monograph and these hand-coloured folio plates can never be surpassed, and are not equalled by modern processes.

EYDOUX and SOULEYET. On the "Voyage autour du monde . . . sur La Favorite", met with a new Bird of Paradise in New Guinea, and published this in 1841, apparently the date of Eydoux's death.

FINSCH, OTTO. German naturalist who visited the South Seas, including New Guinea, later advising the annexation of the North Coast. Collaborated with Meyer in writing up and describing the classic collection made by Carl Hunstein in South-Eastern New Guinea.

FORBES, H. O. English ornithologist who visited New Guinea years after his famous trip to the East Indies, and met with all the bad luck, so that his results were not at all remarkable, especially as he did not even reach Carl Hunstein's happy hunting grounds.

FOERSTER, F. With Rothschild described one of two new Birds of Paradise collected by C. Wahnes in the Huon Peninsula, Foerster naming *Astrapia rothschildi*, Rothschild taking *Parotia wahnesi*.

FORREST, T. "A Voyage to New Guinea and the Moluccas during the years 1774, 1775 and 1776", published in 1779. Includes notes about Birds of Paradise, but also more important an account in English of Valentyn's species translated by Dr. Forster with additions by the latter, but no scientific names.

FORSTER, J. R. The best informed naturalist of his time who translated Pennant's "Indian Faunula" into German, and added a full account of Birds of Paradise from Valentyn and others (as in the preceding), but with scientific names. At Pennant's request this was retranslated and republished in English, on account of the plates and the Essay on the Birds of Paradise.

GARNOT, see LESSON. Surgeon on the Coquille, apparently also interested in ornithology, as he wrote some articles independently.

GEISLER BROS. German collectors who worked on Huon Peninsula.

GESNER, C. Very well-known early writer who included Birds of Paradise in "Hist. Animal (1551-58)" and "Icones Avium (1555)."

GMELIN, J. F. German systematist who prepared an enlarged edition of Linné's "Systema

Naturae", incorporating the numerous additions between 1766 and 1788, especially those of Latham, whose birds had been described in English without scientific names in Latin.

GODMAN, F. D. British naturalist, who specialised in Central American zoology, but described a Bird of Paradise.

GOLDIE, A. Scotch collector who made collections, including birds in New Guinea, in the early eighties of the last century, some reported upon in London, others in New South Wales, causing confusion.

GOODFELLOW, WALTER. One of the most famous of living-bird collectors, who took back from New Guinea for the Zoological Gardens many kinds of Birds of Paradise. He led the British Ornithologists' Union Jubilee Expedition to New Guinea.

GOODWIN, A. P. Accompanied Macgregor and sent a report on Birds of Paradise met with to England (Ibis 1890 pp. 150-156), which fortunately did not anticipate the official account issued by De Vis.

GOULD, JOHN. "The Bird Man", who published many large, beautifully illustrated works on Birds, reaching New Guinea birds in his old age, and the publication was concluded after his death by Sharpe. He had also projected a separate account of the Paradise Birds and Bower Birds, and this was later carried out also by Sharpe, many of Gould's plates from the New Guinea work being used again.

GRANT, CLAUDE. British ornithologist who went to New Guinea for the B.O.U. Expedition (organised by Ogilvie-Grant, q.v.) after the death of W. Stalker, and made excellent collections with good field notes, published in the official report.

GRANT, W. R. O. See Ogilvie-Grant.

GRAY, G. R. Great English systematic ornithologist who with his elder brother J. E. Gray issued a "Catalogue of the Mammalia and Birds of New Guinea, in the collection of the British Museum", in 1859, the first attempt at such a list. "Genera of Birds", with illustrations by D. Mitchell, is the best known of his many systematic works, upon which present usage is based.

GUILIANETTI, A. Italian collector, who accompanied Macgregor, and made excellent collections of birds, some being sent to Italy.

GUILLEMARD, F. H. H. Italian naturalist who visited New Guinea on "The Cruise of the Marchesa" issued in 1886, and made notes on birds collected there.

GUISE, R. E. Accompanied Armit on the Mt. Manaao expedition, which gave excellent re-

sults, including *Cnemophilus mariae*; also visited the D'Entrecasteaux group.

HARTERT, E. German ornithologist who became Head of Lord Rothschild's Tring Museum and with Rothschild issued a long series of notes on Papuan Birds, assisting Rothschild, who especially interested himself in the Birds of Paradise. Sometimes wrote about the Birds of Paradise and their eggs.

HERMANN, JEAN. His notes on birds were issued posthumously by Hammer in 1804, but in an earlier work "Tabula affinitatem Animalium", published in 1783, he named the Sickie Bill, but this was unnoticed or unused for over a century.

HUNSTEIN, CARL. German collector who ventured into the wilds of Southern New Guinea (today only a few miles from the coast by road) and was rewarded by new discoveries of Birds of Paradise which were written up by Finsch and Meyer. Later drowned while collecting.

JAMES, DR. Was killed soon after his arrival in Southern New Guinea, but a small collection of birds sent home contained a new species which was named after him by Sharpe.

JARDINE and SELBY. Famous British ornithologists who named a Bower Bird from Australia.

JONSTONUS, J. A Scotch Pole who published *Historiae Naturalis Animalium* in 1650-52, which had a great vogue, an English translation in 1657, but following Aldrovandus, perpetuated his erroneous conclusions about Paradise Birds.

JUNGE, H. Modern Dutch ornithologist who wrote up the Dutch Expedition's ornithological results in "Nova Guinea". At present Director of the Leyden Museum.

KINGHORN, J. R. Ornithologist at the Australian Museum who had the pleasure of describing the first specimen of the Ribbon Tail, though, unfortunately, a name had previously been given to the tail feathers only, a regrettable action.

KLOSS, C. B. Ornithologist from the Museum of the Federated Malay States, who accompanied the second B.O.U. Expedition under Wollaston, and with the aid of his Dyaks made good collections.

KOWALD, C. One of Macgregor's collectors who did excellent work before he accidentally killed himself.

KUHL, H. Young Dutch ornithologist who went to Java and died very soon. Before his venture eastward he had visited England and monographed the Parrots and Petrels; and also

separated the Satin Bower Bird, which he found in the Linnean Society's Museum generically as *Ptilonorhynchus*.

LABILLARDIERE, J. J. "Voyage in search of La Pérouse", English Translation 1800. Secured a Long-Tailed Bird of Paradise at Waygiou which has not been recorded thence since.

LAGLAÏZE, LEON. French collector.

LATHAM, JOHN. Great British ornithologist who wrote a General Synopsis of Birds following the style of Linné but in English and much more complete, including many additions, some of them Birds of Paradise, which were scientifically named by Gmelin before Latham's Latin Index was produced.

LAWES, W. G. Pioneer British clergyman in Southern New Guinea, who was interested in birds and to whom the Lawes' Bird of Paradise, a well-known Superb Bird, was dedicated.

LESSON, R. P. Great French naturalist who accompanied Garnot as surgeon on the Coquille and after describing the birds collected on the voyage, a complete account of which was prepared by them, continued with works on Mammals, Birds, and then a Monograph of the Birds of Paradise. His field notes on Birds of Paradise were well quoted long before Wallace's essay, which is sometimes claimed as the earliest account.

LEVAILLANT, F. Great ornithologist who travelled in South Africa and issued a magnificent account of the Birds in large folio with coloured plates, and owing to its success, followed with "Histoire Naturelle des Oiseaux de Paradis et des Rolliers (1801-6)" and "Histoire Naturelle des Promerops et des Guépiers (1806-)", the latter including some birds now classed as Birds of Paradise, while some in the earlier work so classed are not now included.

LEWIN, J. "Birds of New Holland", issued in 1808, gives the first illustration of the Regent Bower Bird, the name applied by Skottowe a little later, but he did not use the word "Bower" as that appears to be due to Coxen or Gould.

LINNE, C. The founder of modern systematic Natural History whose knowledge of ornithology was not extensive, and though he is credited with the introduction of *Paradisea*, only two species were mentioned, although others had been described, but the name *Paradisea* gained usage in preference to *Manucodiata*.

LINSCHOTEN, J. H. VAN. English translation of "The Voyage of John Huyghen van Linschoten to the East Indies", appeared in 1598, the original Dutch in 1596, and has been

quoted on account of his apparent first-hand knowledge, which was, however, mostly hearsay, as he stated "they have neither feet nor wings."

LORIA, L. Italian collector whom Macgregor accused of excesses against natives. Salvadori named his birds.

MACGREGOR, W. First Governor of British New Guinea, whose energy in investigating his charge made ornithological history, as he always accompanied himself with natural history collectors, and by his own keenness enthused all his staff. The collections made by himself, Armit, Guise, Kowald, Guilianetti, and others, were described by De Vis in an excellent manner.

MAGELLAN, F. Magellan's is commonly quoted as the first voyage round the world, but only one ship out of five performed that work, and Magellan had been killed at the Philippines. After his death the vessel touched at Tidore and received Birds of Paradise skins which were the first to reach Western Europe.

MANTOU. Plume dealer in Paris.

MARCGRAVE, G. "Historiae rerum naturalium Brasiliae 1648", dealing with Natural History of Brazil, mentions Birds of Paradise en passant, but has been commonly quoted. Of course, Birds of Paradise have nothing to do with the birds of Brazil.

MATHEWS, G. M. Author of the "Birds of Australia", in which Australian Bower Birds and Birds of Paradise (Rifle Birds) are fully dealt with, coloured figures being given. Also compiler of the "Systema Avium Australasianarum", 1932, in which all the Birds of Paradise and Bower Birds are listed to that date with synonymy.

MAYER. See Shaw-Mayer, as there are two other similar sounding names commonly occurring in New Guinea ornithology.

MAYR, E. German ornithologist who made collecting expeditions to New Guinea, and, later appointed to the American Museum of Natural History, compiled a List of New Guinea Birds, published in 1941.

MEEK, A. S. British collector especially for Lord Rothschild in the Solomons, New Guinea, etc. Reached Mt. Goliath in western Central New Guinea.

MENEGAUX, A. Ornithologist at the Paris Museum who received and described Birds of Paradise from Mantou and other dealers.

MESTON, A. Australian collector who found the male of *Prionodura newtoniana* on the

Bellendenker Queensland Expedition, the genus and species having been described from a female.

MEYER, A. B. German collector who visited New Guinea and made excellent collections, becoming very interested in the Birds of Paradise. Later Director of the Dresden Museum when he published a List of Paradise Birds to that date, 1893, in the Museum record.

MONTBEILLARD, P. G. DE. Prepared the text to the famous Planches Enluminées, that is of Buffon's Natural History of Birds (q.v.), but did not use scientific names.

MULLER, SALOMON. Wrote a History of the East Indies, but had visited Triton and Lobo Bays in South-West New Guinea.

NEUMANN, O. German ornithologist, a specialist in African birds, who named a couple of Birds of Paradise of uncertain status from unknown locality, and hence very difficult to determine.

NEWTON, A. Author of "A Dictionary of Birds", in which is included a Bibliography of Ornithology, which is beyond comparison, and stamps him as the everlasting greatest authority on the subject. Gives a good historical account of the Birds of Paradise and Bower Birds.

NORTH, A. J. Ornithologist at the Australian Museum, Sydney, when he wrote Aust. Mus. Special Catalogue No. 1 dealing with the Nests and Eggs of Australian Birds, including, of course, those of the Birds of Paradise and Bower Birds with figures of eggs, mostly plain.

Ogilvie-Grant, W. R. Ornithologist at the British Museum (Natural History), where he organised the Jubilee Expeditions of British Ornithologists' Union, 1909-11, 1912-13, and reported upon the collections in the Ibis, Jubilee Suppt. 2, 1915, wherein is included a bibliography of papers on the birds of New Guinea, published from 1883 to 1915, which is very useful. Includes many forms (25) of Birds of Paradise and Bower Birds, about which he gave notes, systematic and field.

OORT, E. D., also van Oort. Dutch ornithologist who has described Birds of Paradise sent to the Leyden Museum.

OUSTALET, E. French ornithologist at the Paris Museum who described some Birds of Paradise sent to the Museum by dealers as Mantou.

PALUDAN, K. Associated with Hartert, Rothschild and Stresemann in the authorship of a report on the birds collected by Stein in the Weyland Mountains.

PAYKULL, G. Swedish naturalist who achieved world fame through his description of the original Cat Bird from unknown locality.

PENNANT, THOMAS. British naturalist who wrote a small Indian Faunula: this was translated into German by J. R. Forster, who added a monograph of the Birds of Paradise. Later at Pennant's request the fuller account was retranslated back into English.

PIGAFETTI, A. An Italian who accompanied Magellan, and upon arriving safely back in the Vittoria (Victory) wrote an account of the voyage which became classic, including the first report of Birds of Paradise into Western Europe.

QUOY and GAIMARD. Surgeons and co-workers on the birds of the French expedition on the Astrolabe, which touched New Guinea. Quoy had previously visited New Guinea on the Uranie, but that ship was wrecked on the voyage home and some of the bird collections lost.

RAMSAY, E. P. Australian ornithologist, later Curator of the Australian Museum, Sydney, who described the collections of New Guinea birds made by Broadbent, Goldie and others, including Birds of Paradise and Bower Birds. As Goldie, a dealer, had sent some of the collections to England, confusion in names occurred.

RAND, A. L. Ornithologist with Archbold's Expeditions to New Guinea, from the American Museum of Natural History, who has reported upon the later collections. He has named *Archboldia papuensis*, a very peculiar relative, apparently, of the Gardener Bower Birds.

REICHENOW, A. German ornithologist, Director of the Berlin Museum, authority on African birds, described Paradise Birds.

ROSENBERG, H. VON. German collector who collected in the 1860's at the Aru I., and also the mainland, the Aru specimens going to Leyden Museum, catalogued by Schlegel.

ROTHSCHILD, LORD. Great British naturalist who developed his own Museum at Tring, England, and who was interested in Entomology as well as Ornithology and Mammalogy. Initiated many expeditions, those of Meek to New Guinea for Butterflies and Birds, especially Birds of Paradise, being notable. Wrote an account of the Birds of Paradise for *Das Thierreich* and many papers on this group, sometimes in association with Hartert, the head of his Museum, also a great ornithologist.

SALVADORI, T., COUNT. Great Italian ornithologist who specialised in the birds of this district, compiling a monumental work, *Ornitologia Molucchi e Papua*, in three volumes and appendix, 1880-1882 and 1889-1891. It is purely a technical work, in Latin and Italian, without any illustrations, covering the birds of the Moluccas, New Guinea to the Solor Is., listing all the Birds of Paradise, but not all the Bower Birds. Is an invaluable book of reference to the older literature.

SCHLEGEL, H. Dutch naturalist, Director of the Leyden Museum. He was very conservative even for his time, 1860 to 1870, and consequently his conclusions were not approved by his successors, though now there seems a revival of his ideas in the newer ornithology. Issued a List of Paradise Birds mostly collected by Bernstein, Rosenberg and S. Muller in the "Museum des Pays-Bas", livr. 9, 1867, pp. 78-122.

SCOPOLI, G. A. Italian doctor who compiled a "Del. Florae et Faunae Insubricae", published in 1786, which included diagnoses and scientific names for the birds figured and described by Sonnerat. The work is very rare and valuable, so a reprint was made by the Willughby Society in 1882 for general usage.

SEBA, A. "Locupletissimi rerum naturalium thesauri 1734-1765", figures of the specimens of natural history in his Museum included ten Birds of Paradise, of which three, at least, were artefacts. The figures are commonly quoted in later scientific works, but fortunately the artefacts were easily recognised.

SHARPE, R. B. The greatest ornithologist of his time, the head of the Bird Department at the British Museum (Natural History), initiated and wrote many volumes of the Catalogue of Birds in the British Museum, the major book of reference in bird systematics. Completed Gould's Birds of New Guinea, and then published a magnificent folio work with coloured plates of the Birds of Paradise and Bower Birds completed in 1893, the last illustrated work on this subject. In the History of the Collections in the British Museum (Natural History) he published a bibliographical account of donors of specimens to the Bird Department.

SHAW, G. One of the early curators of the British Museum (Natural History), who published a General Zoology as well as other important works. In the early volumes he described Birds of Paradise and leaving the work unfinished, Stephens named some others.

SHAW-MAYER, F. Australian naturalist who has collected (and is now collecting) in New Guinea, more especially living specimens for the zoological gardens.

SONNERAT, P. French naturalist who wrote a "Voyage to New Guinea," but did not reach the mainland. He, however, figured and described completely six Birds of Paradise, the first paintings from life. As he was not a systematist it was left to others to provide scientific names for his objects.

SOULEYET. Co-traveller with Eydoux.

STEPHENS, J. F. British naturalist, mainly an entomologist, who completed Shaw's "General Zoology", introducing new names and new species for Paradise Birds.

STRESEMANN, E. German ornithologist, Director of the Berlin Museum, who suggested that many rare Birds of Paradise were of hybrid origin, without much evidence to support the theory. He also reported on Burgers' collection from the middle Sepik, furnishing an excellent account of the birds of Northern New Guinea, with notes on many of the extralimital species.

SWAINSON, W. Great British naturalist, excellent draughtsman, who was the first to name the Rifle-Bird. In a small work called "Taxidermy", he included a bibliography of zoologists which is very useful for reference.

TEMMINCK, C. J. The predecessor of Schlegel at the Leyden Museum, who published, with Laugier, a continuation of folio plates similar to the Planches Enluminées, commonly known as the "Planches Colorées", wherein the Cat Bird from New Guinea was described.

VALENTYN, F. Published a history of the East Indies in 5 volumes, "Oud en nieuw Oost-Indien . . ." in 1724-26, English and French translations soon following. In the third volume appears an account of the Birds of Paradise, which formed the basis of Forster's Essay, which appeared in German in 1781, with the English translation in 1791.

VAN OORT. See Oort.

VEILLOT, L. J. B. Brilliant French ornithologist who published a little work "Analyse

nouv. Ornith.", in 1816, wherein he introduced new generic names for Birds of Paradise, and later wrote many articles in the Dict. Sci. Nat. Previously he had, with Audebert, published a series of coloured plates under the title "Oiseaux dorés, ou à reflets métalliques", in 1802, which included Birds of Paradise.

WAGLER, J. G. German ornithologist, who prepared a series of small monographs for a "Systema Avium", including one of the genus *Ptilonorhynchus*, but this was never completed as he was accidentally killed at the early age of thirty-two.

WAHNES, C. German collector on Huon Peninsula after whom Rothschild named *Parotia wabnesi*.

WALLACE, A. R. British naturalist, who, after exploring in the Amazons, switched to the East Indies, and became world famous through his essay on Evolution, which was read with Darwin's theories, and simultaneously published. Was very interested in the Birds of Paradise, and gave a good account in English, and included this in his work "The Malay Archipelago (1869)", whose sub-title was "The land of the Orang-utan, and the Bird of Paradise."

WARD, J. English bird dealer, who described Elliot's Bird of Paradise, gave it to Elliot to figure, and Elliot's figure and description were published before Ward's.

WILLUGHBY, F. Great British ornithologist who compiled the epoch-making work, "Ornithologiae", issued in 1676, and in English in 1678, included full accounts to date of Birds of Paradise.

WILSON, JAMES. In his "Illustrations of Ornithology", a folio work, included *Epimachus brisbanii*, published in 1831, in which the Rifle Bird is called "Velvet Bird".

WILSON, EDWARD. Procured birds in Europe for his brother Thomas in Philadelphia, U.S.A., and Ogden named *Ptiloris wilsonii*, an artefact, but Cassin named the Bareheaded Little King, *Paradisea wilsonii*, and it is sometimes known as Wilson's Bird of Paradise.

