

A REVISION OF THE BIRD FAMILY DICRURIDAE

CHARLES VAURIE

BULLETIN

OF THE

AMERICAN MUSEUM OF NATURAL HISTORY

VOLUME 93 : ARTICLE 4

NEW YORK : 1949

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Volume 93, article 4, pages 199–342, figures 1–14, tables 1–12

Issued May 23, 1949

Price: \$1.75 a copy

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INTRODUCTION

AFTER THE PURCHASE of the Rothschild Collection, the bird collections in the American Museum were rearranged in accordance with modern information. In the case of the Dicruridae, however, such information was lacking for the family as a whole. The last complete arrangement, that of Sharpe in the "Catalogue of the birds in the British Museum," dated from 1877 and was hopelessly out of date.

Dr. Ernst Mayr and Dr. James P. Chapin, who directed the various workers engaged in rearranging the collections, suggested that I should undertake the revision of this family.

During the course of this study, close to 3600 specimens were examined, all but two of the forms recognized in this paper being represented. These two forms are restricted to the small outlying islands of Banguey and Balambagan, off northern Borneo (*Dicrurus paradiseus banguey*); and to Coco and Table Islands, off the northern Andamans (*Dicrurus*

andamanensis dicruriformis). Of one additional form, *Dicrurus remifer lefoli*, no typical specimens were available, but two specimens intermediate between *lefoli* and its neighboring form were examined. As these three forms are separable only by size differences (small in the case of *banguey* and *dicruriformis*), their absence from the list of available specimens should not affect the conclusions reached in this revision.

Included in the specimens were all of the excellent series collected by Dr. William L. Abbott on the small islands off the lower Malay Peninsula and Sumatra. This material is of critical importance, not only because it comes from seldom visited islands, but also because Dr. H. C. Oberholser described from it so many "new" forms.

All told, 50 types were examined, 16 of these being Oberholser's. In addition to these 50 types, I have indicated as far as possible the location of the other types.

ACKNOWLEDGMENTS

This study would have been impossible without the assistance and encouragement that I received from Dr. Ernst Mayr and Dr. James P. Chapin. They started me on it and guided me throughout. They are wonderful teachers and whatever knowledge of birds I have acquired is owed entirely to them, but the part that I cherish most will ever be our friendly association. Dr. Mayr, in addition, had the further kindness to read the entire manuscript twice and to suggest many improvements.

To Mr. Jean Delacour and Mr. Henry C. Deignan I owe also much gratitude for their interest, help, and valuable suggestions. Dr. J. T. Zimmer, Dr. S. D. Ripley, and Mr. D. Amadon have also aided in various ways.

The revision could not have been complete without the generous cooperation of other

institutions. Chief among these were the United States National Museum and the Academy of Natural Sciences of Philadelphia. Dr. Herbert Friedmann lent me all of the indispensable material collected by Dr. Abbott, and Mr. Rodolphe de Schauensee extensive series from Siam. To these two gentlemen I owe much gratitude for their gracious help. Other institutions, and to their authorities, to whom I am also in debt are the Museum of Comparative Zoölogy, the Chicago Natural History Museum, and the Carnegie Museum. To Dr. G. C. Junge I feel I owe special thanks for the prompt way in which he came to my help during a period of international stress by measuring and examining specimens under his care at the Leiden Museum.

GENERAL REMARKS

FAMILY CHARACTERS

GENERAL CHARACTERS that hold good throughout the family will be mentioned here, and they will not be repeated again, except in the case of specific instances.

Both sexes are exactly alike in appearance, the only difference being a slight one in size, females consistently averaging smaller.

Bill, legs, and feet are always black.

Except as noted, the color of the iris in the adult in life is red. In the few forms that constitute exceptions, it is brown or white, but regardless of what the color in the adult may be, in all immature drongos the color of the iris is brown. There may be individual exceptions; according to Kloss (1918, p. 228) in *Dissemurus* [= *Dicrurus*] *p. paradiseus*, "A crimson iris does not always seem to go with immaculate [i.e., adult] plumage, nor a brown one certainly indicate immaturity; only one of this series [collected in central Siam] has the iris red, and the bird is considerably more white-barred than are other specimens with brown irides; its crest is also much smaller."

Similar instances probably occur in other forms. Collectors' labels, however, can be misleading; in some series of a form in which the color in life is known to be red, some adults will be noted as having the iris of normal color, while in others it is indicated as brown. It is difficult to know whether this represents individual variation or, what is perhaps more likely, the given color depends on the freshness of the specimen.

PLUMAGES

There is but one moult a year which, in the more northern birds, takes place in late summer or early autumn. However, the time of the moult differs in various parts of the range, and birds can be found moulting in every month of the year. It is best therefore to refer to the plumage by the terms first, second, or third annual plumage. Some authors have made the statement that the birds do not attain full size and adult plumage until the second year. This may be true of some forms but does not apply to others. For instance, in *Dicrurus remifer* and *Dicrurus paradiseus*,

the only forms in which I studied the plumage sequence, the birds do not reach full size or have the other characters of the adult until the third annual plumage has been attained. Birds still in their first annual plumage I have called immatures, and those that I could determine were in the second annual plumage I have called subadults.

It is not difficult to distinguish the immature plumage; the birds are much less glossy, less dark, and the quills are brownish. The outermost primary is longer proportionately and is rounded at its tip, whereas the tips of the rectrices are less squarish or rounded, more pointed. In many forms the under plumage is barred below with white or buffy terminal fringes. These marks are present also on the under tail coverts, and there are abundant large white tips on the axillaries and sometimes white feathers along the inner bend of the wing. The crest is lacking or rudimentary, and in the racket tail forms the outer pair of rectrices is not elongated and is fully webbed in *Dicrurus remifer*, or its shaft is prolonged but not fully denuded of barbs as in *Dicrurus paradiseus*. Immatures are always consistently smaller than adults.

The subadults are more difficult to distinguish, but familiarity and comparison with undoubted adults will enable one to distinguish such specimens without trouble. In this plumage the ornamental characters, such as crest, rackets, curl of the tail, or intensity and extent of the gloss, are definitely less fully developed. In the forms with rackets, the bare shaft is shorter and retains always a certain amount of barbs. In these forms, as well as in those that have no rackets, the under tail coverts are still fringed with white, whereas the white has disappeared from the rest of the under plumage. This mark is excellent as it is almost always present in the subadults. The white tips on the axillaries are not reliable, for they are the last to disappear and are still found, though smaller and fewer, in many otherwise fully adult specimens. They eventually disappear completely. The measurements of the subadults are erratic; for example, the measurement of the wing may be indistinguishable from that of the

adult and the measurement of the tail may be very different, or vice versa. The measurements of the subadults also average smaller than those of adults.

These remarks as to the immature and subadult plumages can only be general and will not apply equally to all the forms. They are important because in a family of birds in which differences are not easily established by variations in color, and where the structural characters are variable, so many of the races can be separated safely only on dimensions. Care must be taken therefore to avoid mixing indiscriminately the measurements of both sexes and, what is even worse, including the measurements of birds that are not fully adult.

Therefore, all the measurements used in this revision are, except where specifically noted, only those of fully adult specimens. These measurements and the way in which they were taken are given below.

MEASUREMENTS

All measurements are in millimeters.

The length of the bill was taken in two ways. In the species with the shorter bills the length refers to that of the whole culmen measured from the skull. In those with the longer bills, the length was measured from the anterior border of the nostril, as in *Dicrurus hottentottus*, or both methods were used, as in *Dicrurus andamanensis* and *Dicrurus paradiseus*. For the sake of comparison the method chosen is the one that has been most generally used. Where the choice of method is not specifically stated, the length of the bill is that of the whole culmen. The depth of the bill is the vertical distance measured at the nostril.

The length of the wing was taken with the wing pressed down flat on the rule.

The length of the tail was taken from between the insertion of the two central tail feathers. The length of the central pair is abbreviated throughout as C.T.F., and that of the outer pair as O.T.F. The depth of the fork refers, of course, to the difference between the two.

The length of the crest was taken by pulling it erect to its fullest extent and measuring from the base of the culmen at the skull.

In the forms with racket tail, additional measurements include those of the length of the racket and its greatest width, and in *Dicrurus remifer* the length of the bare, wire-like shaft as well. This latter was measured from the point at which the webs of the outer pair of rectrices cease to the point where they begin again at the proximal end of the racket.

The measurement of the bare shaft is very variable, less so in *Dicrurus remifer* than in *Dicrurus paradiseus*; in the latter it was of such questionable value that it was finally discarded. In these two forms, the length of the O.T.F. refers to the total length of that feather, that is, the webbed part, plus the bare shaft, plus the racket. I make this point because some authors do not include in the length of the O.T.F. the length of the bare shaft and that of the racket. However, since the length of the webbed part is also variable, I think it best to give the measurement of the whole of the feather.

Another measurement is that of the wing tip index, or the difference between the length of the longest and that of the innermost primary. It was computed only in the case of *Dicrurus leucophaeus*. It was thought this measurement might be of use in the discrimination of migratory versus resident forms, but as the results were not significant it was discarded. The wing tip index is mentioned nevertheless because it may not apply in the drongos.

PROPORTIONS

Three sets of proportions were computed: the length of the bill to that of the wing, the length of the O.T.F. to that of the wing, and that of the O.T.F. to the C.T.F. The ratios, expressed in per cent, appear in table 12 at the end of the systematic section (see p. 333).

ECOLOGY

The ecological requirements of the Dicruridae remain to be worked out. On the whole they are very adaptable birds; some keep to the forest and never seem to be found outside it, such as *Dicrurus atripennis*, *Dicrurus adsimilis coracinus*, and *Chaetorhynchus papuensis*, and largely *Dicrurus remifer*, but others, and this includes the majority of the species, may be found in

every type of country. Some, like the common King Crow (*Dicrurus macrocercus*), definitely prefer the neighborhood of human habitations and are found in the gardens of villages and towns, or in patches of open cultivation. About the only thing that seems to be required is some kind of vantage point from which to sally forth in the pursuit of insects—telegraph wires, backs of cattle, or fence posts being especially desirable.

The extent of the range of a species may vary from tiny islands to the greater part of a continent, and the height at which it breeds varies from sea level to considerable altitudes. In the Aldabras the drongos breed on what are virtually sand bars, the area of the islands amounting only to 152 square kilometers and, with the exception of mangroves and areas of tangled brush, most of it barren. In contrast, *Dicrurus leucophaeus* has been collected in May in the forests of northern Yunnan at altitudes of from 7000 to 10,000 feet, and at 10,000 feet on Mt. Ardjuno in Java.

In some of the other species, the maximum heights at which specimens in my series have been collected while breeding or during the breeding season are: *Chaetorhynchus papuensis*, 7000 feet, in the Owen Stanley Mountains; *Dicrurus ludwigii*, 5600 feet, near Rungwe, Tanganyika Territory; *Dicrurus aeneus*, 8000 feet, near Tengyueh, northwestern Yunnan; *Dicrurus adsimilis*, 5500 feet, at Wagar, British Somaliland;

Dicrurus macrocercus, 5000 feet, Mt. Gedeh, Java, and 7000 to 8000 feet, near Tengyueh; *Dicrurus hottentottus*, 2500 feet, New Guinea, and 7000 feet at Tengyueh and on Batjan Island; *Dicrurus montanus*, 5000 feet, at Lati-modjong, Celebes; *Dicrurus paradiseus*, 7000 feet, Gunong Tahan, Pahang; *Dicrurus remifer*, 4300 feet, northern Siam, 6400 feet, Mt. Gedeh, and 6600 feet in the Langbian Peaks of southern Annam. In addition, Baker (1924) reports *Dicrurus macrocercus* as breeding at 7000 feet in Simla, northern India, and *Dicrurus caerulescens* at 6000 feet, also in northern India.

SYNONYMY

The synonymy is complete. A few names that have appeared in the literature may be missed—being *nomina nuda* I have tried to steer clear of them.

VERNACULAR NAMES

About three-quarters of the species have English names or, in one or two cases, either a native name or a translation, such as "King Crow," which has passed into common usage. I have supplied English names to the species that had none. In the case of those that already had names, such names were retained if appropriate but changed if misleading. I have tried to select names descriptive of the species or of its habitat or, if not possible, names that are at least geographically appropriate.

PHYLOGENY OF THE DRONGOS

GENERAL POSITION OF THE FAMILY

IN THE WORDS OF Tweeddale (1878, p. 69), "The Dicruridae constitute a natural, self contained, sharply defined family," its members ranging throughout the Ethiopian, Oriental, and Austro-Papuan regions. But, if there is no difficulty in recognizing any member of this family as a drongo, there is doubt as to the drongos' nearest relatives. Tweeddale points out that in their habits they are much like the Muscipidae, and says, "I agree with Jerdon [1862] in classing them between the Shrikes and the Flycatchers." However, as far as habits are concerned, they are still closer to the flycatchers of the New World. As no one could maintain that the drongos are related to the Tyrannidae, this affinity of habits appears to be a case of ecological counterparts, such as discussed by Friedmann (1946), in which two originally quite divergent forms have come to occupy similar ecological niches.

Other authors, such as Sharpe (1877), have placed them directly after the crows, birds of paradise, and orioles. In this view, Sharpe is supported by no less an authority than Hartert who says (1919, p. 130), "The Dicruridae are, in Sharpe's Handlist, most judiciously placed next to the Paradiseidae to which they are, in my opinion, nearest related. Only recently E. C. Stuart Baker called my attention to the striking similarity of many of their eggs to typical Paradisea eggs." To this perhaps could be added the development of a highly metallic plumage, and the tendency to have ornamental appendages such as elaborate crests, denuded wire-like shafts ending in rackets, and neck hackles.

I cannot judge as to whether the relative position of the nares to the gape is or is not a sufficiently comprehensive character for associating the drongos with the crows and orioles, but all the modern authors maintain them in this position. In what may be the latest complete list of families of birds, Mayr (1946) placed them at the very top. The order of the families at the top of the list is as follows: weavers (Ploceidae), starlings (Sturnidae), bell-magpies (Cracticidae), wattle-

birds (Callaeidae), drongos (Dicruridae), orioles (Oriolidae), bowerbirds (Ptilinorhynchidae), crows, magpies, and jays (Corvidae), and birds of paradise (Paradisaeidae).

EVOLUTION

A detailed study of the evolution in this family, based on the present revision, has been published by Mayr and Vaurie (1948).

PHYLOGENY

Whatever the origin of the family, the phylogeny of the various species within it is fairly simple. Their present day appearance shows that they have undergone various modifications and have developed certain specialized features. Thanks to the fact that the existing characters still show most of the successive steps, the accompanying family tree can be reconstructed (fig. 1).

Chaetorhynchus papuensis is placed at the bottom of the tree, since it is the only drongo that still has 12 tail feathers. All other drongos have lost one pair and possess only 10 tail feathers.

Next comes *Dicrurus ludwigii* of Africa, a very plain and unspecialized little species but which has nevertheless developed the characteristic forked tail with its 10 feathers. Following *ludwigii* comes *Dicrurus atripennis*, also of Africa. Though this form is more advanced than *ludwigii* in that it has developed a fairly strong metallic gloss, it is still primitive, the distribution of the gloss being uniform and showing none of the specialized restriction of the higher species.

Chaetorhynchus papuensis, *D. ludwigii*, and *D. atripennis* are all small forms which apparently had their origin as independent branches. The remaining 17 species, however, appear very strongly to have sprung from but one larger and more robust common ancestor.

No living species can be the ancestor of another living species, but by the elimination of the specialized features it is possible to reconstruct this common ancestor. In drongos the common ancestor survives, or rather is represented by, a living species which, probably little modified and vigorous as ever, is the prevalent drongo in Africa and India.

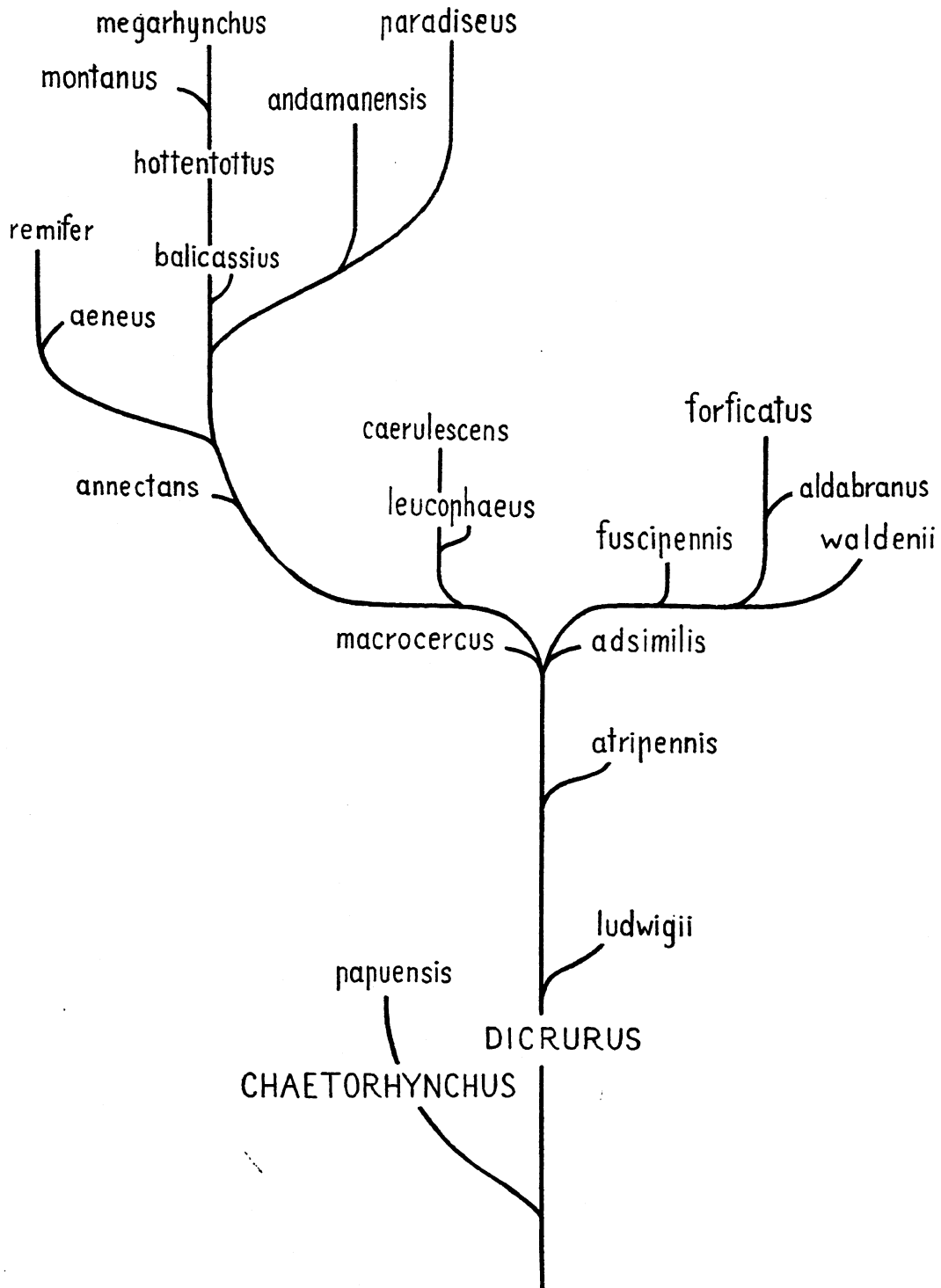


FIG. 1. Diagrammatic phylogeny of the Dicruridae.

This bird, *Dicrurus adsimilis* in Africa and *Dicrurus macrocercus* in the Oriental region, is the most "typical," as well as the most successful of all drongos. In India, where it is called the King Crow or the "King of the Birds," it is also one of the most abundant, as well as one of the most adaptable of all birds. All the drongos, except the three more primitive forms, have been directly derived from it or from a similar ancestor, and a glance shows that all these higher drongos can be divided into two general groups, the connecting link between the two being still rather easily discernible.

GROUP 1

This group includes, besides *adsimilis* and *macrocercus*, the species of the Madagascar region and two Asiatic species (*leucophaeus* and *caerulescens*). *D. adsimilis* and *macrocercus* are still very close to each other and have been considered by some authors, such as Sharpe (1877) and Deignan (1945), to be conspecific. However, the existence of distinct proportions between the African and Asiatic populations shows that today *adsimilis* and *macrocercus* represent a breaking into two of the common drongo. If both are placed within one superspecies (*adsimilis*) their relationship is emphasized without their differences being obscured. From the *adsimilis* end of this superspecies were derived all the island species off the coast of east Africa. Perhaps closest of all to *adsimilis* is *fuscipennis* of Grand Comoro, followed by *aldabranus* of Aldabras, and *waldenii* of Mayotte. A certain tendency of the frontal feathers in *aldabranus* to be prolonged and to curve upward suggests that *forficatus* of Madagascar and Anjouan was derived from the same offshoot that gave rise to *aldabranus*.

From the *macrocercus* end of the superspecies, but no longer forming part of it, were directly derived two branches. Least removed is the one that led to present day *leucophaeus*, from which in turn *caerulescens* was derived. Probably of more ancient origin, and most important of the whole family from the standpoint of vigorous expansion and multiplicity of forms, is the branch that led to

present day *annectans*. With this species as a connecting link we pass on to group 2. The species in group 1 are still relatively primitive. Their gloss is dull or lacking and, if present, is never restricted to certain parts of the feather or areas of the body. Even the black of the body is uncertain; it is not always intense and may become modified into slate, gray, or brown. Ornamental modifications such as rackets, hackles, spangles, or crest have not as yet developed, except in the single instance of *forficatus* where a simple crest has appeared.

GROUP 2

All the species in this group are more specialized. Their gloss is well developed, often brilliantly so, and instead of having a uniform distribution is limited to the edges or centers of the individual feathers, resulting in a scaly or spangled appearance. Other ornamental features characteristic of this group are neck hackles, crests, and tail rackets. *D. annectans* is the perfect link between the two groups; in appearance it is still deceptively close to *macrocercus*, but it is more robust, glossier, and its gloss is already arranged in a scaly pattern.

An early offshoot from an *annectans*-like ancestor led to the development of *aeneus* and ultimately to *remifer*. The main branch continued directly from *annectans* to *balicassius* and from this latter to *hottentottus*. At some stage prior to *balicassius* this branch gave off a side branch from which evolved, probably independently from one another, *andamanensis* and *paradiseus*.

As the form known today as *hottentottus* arrived in the Moluccas, via *balicassius* and the Philippines, it spread in a number of separate directions. Two of the resulting forms (*montanus* and *megarhynchus*) have already attained specific status, but they are still so closely related to *hottentottus* that I include them within one superspecies (*hottentottus*).

The tree is still vigorously growing; *hottentottus*, *paradiseus*, and probably several others are still giving off offshoots that have almost grown over the species threshold.

THE GENERA OF DRONGOS

SHARPE'S "HANDLIST" (1909) recognizes 12 genera of drongos which are listed in the following order: *Dicrurus*, *Chibia*, *Dicruropsis*, *Chaetorhynchus*, *Chaptia*, *Bhuchanga*, *Edolius*, *Dissemuroides*, *Dicranostreptus*, *Bhringa*, *Dissemurus*, *Dissemurulus*.

In so doing he ignored Tweeddale's important criticisms (1878) of his (Sharpe's) prior arrangement of the Dicruridae (1877). Tweeddale pointed out that many of the characters given by Sharpe are clearly only specific and do not warrant the retention of so many genera. He specifically rejected *Dicranostreptus* and *Dissemuroides*, and by indirection *Dissemurulus* as well, since this latter was to be proposed some 10 years later for the single form (*Dicrurus paradiseus lophorinus*) to which he had refused generic rank under *Dissemuroides*.

Since the time of the "Handlist," modern authors have reduced the number of Sharpe's genera still further, by pointing to the existence of connecting forms and by showing that there is a complete gradation of characters between species formerly separated into supposedly distinct genera. For instance, Hartert (1919) no longer recognizes *Chibia*, *Dicruropsis*, and *Bhuchanga*. *Edolius* had, of course, long since been merged under *Dicrurus*, and *Dissemurulus* was very conclusively and neatly disposed of by Henry (1933).

To be sure, since the time of the "Handlist" two additional generic names had appeared, but one, being a *nomen nudum* brought forth by Mathews, will not be quoted here, and the other, *Dicrachibia*, proposed by Hachisuka in 1928, was quickly and very correctly rejected by Rensch (1931).

This leaves but five genera: *Dicrurus*, *Chaetorhynchus*, *Chaptia*, *Bhringa*, and *Dissemurus*, and of these all but *Dicrurus* are monotypic. Very early in the course of this revision it became evident that this number was still too great, and that eventually probably no more than two genera would be retained. Delacour (1946) gives these two as *Dissemurus*, for the species in which the elongated outer rectrices end in rackets, and *Dicrurus*, for all the other species with a more normal tail. Under this tentative arrange-

ment *Bhringa* would have been merged with *Dissemurus*, and *Chaetorhynchus* and *Chaptia* with *Dicrurus*.

At first glance this would appear to be the obvious arrangement. However, further study has shown that this arrangement had to be greatly modified. The final conclusion is still that two genera are recognizable, but these are *Chaetorhynchus* and *Dicrurus*, not *Dissemurus* and *Dicrurus*.

The division based on the presence, as against the lack, of a racket tail had to be rejected entirely. In the first place *Bhringa* cannot be merged with *Dissemurus*, for the structure of its racket is totally different. However, the presence of rackets is not important from the standpoint of generic distinction. For this, the only character in which they both differ from *Dicrurus*, is inconstant, and is bridged in both cases by connecting forms. The inescapable conclusion is, therefore, to merge both with *Dicrurus*.

Chaptia is likewise not separable from *Dicrurus*; the characters of its only species (*aeneus*) are far less specialized than those of either *Bhringa* or *Dissemurus* and are very obviously only specifically distinct from those of other species of *Dicrurus*.

Chaetorhynchus, on the other hand, differs from all the other species in the family by one important characteristic (a different number of feathers in the tail), and by several minor ones (a different shape of bill, considerably longer rectal bristles, and white scapulars).

CHARACTER VARIATION

The characters used in the past for the generic separation of the species of drongos were: depth of the fork, shape and structure of the tail, shape of the bill and its feathering, length of the rectal bristles, intensity of the gloss, and presence or absence of a crest. Since all of these characters are of very unequal value and may vary geographically, often within a species, they will be discussed below.

TAIL

The shape and structure of the tail and the depth of the fork are the two characters that

have been most commonly used. Although some species were separated solely on the basis of the relative depth of the fork, there is no character that shows so much variation. The great range of this variation is illustrated in figure 2. All the tails shown but one, *D. megarhynchus*, belong to one single species, *D. hottentottus*. It can be seen that in this species the depth of the fork may be extremely shallow (1 mm. in one case, 5 or less in several

longation in *megarhynchus*, and the denuded shafts ending in rackets in *remifer* and *paradisus*.

As far as the tips of the outer tail feathers are concerned, there exists also, as in the case of the depth of the fork, a perfect gradation between species of *Dicrurus* in which the tips of the outer tail feathers are straight and flat, to those in which the tips flare outward and then begin to curve upward, to end

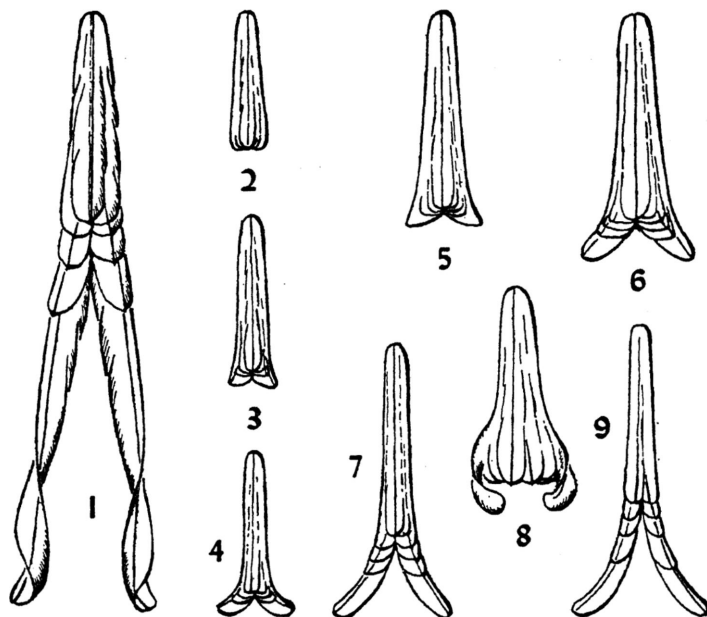


FIG. 2. Variation in the structure of the tail and the depth of its fork in the superspecies *hottentottus*. 1. *D. megarhynchus*. 2. *D. hottentottus samarensis*. 3. *D. h. sumatranus*. 4. *D. h. renschi*. 5. *D. h. longirostris*. 6. *D. h. atrocaeruleus* (the basic shape in *D. hottentottus*). 7. *D. h. densus*. 8. *D. h. hottentottus*. 9. *D. h. menagei*.

others), or very deep (50 in one case, 70 in another). In view of the fact that within these two extremes there are all kinds of gradation between the separate species, as well as within the races of *hottentottus*, the depth of the fork is an extremely poor character to use for generic separation.

The structure of the tail has, of course, attracted a great deal of attention, and many of the genera have been based on the various kinds of modification undergone by the outer tail feathers, such as the curly tips found in some races of *hottentottus*, the enormous pro-

longation in *megarhynchus*, and the denuded shafts ending in rackets in *remifer* and *paradisus*. This is also shown in figure 2.

Dicrurus megarhynchus is included in figure 2 because this form is intimately related to *D. hottentottus*. The enormously prolonged outer tail feathers of *megarhynchus* are very striking, but were it not for this character, this single form would otherwise differ from the other geographically representative forms of *hottentottus* only by its longer wing and larger bill. In fact, the authors of *megarhynchus* definitely stated in the original discussion that they attached no

particular significance to the tail feathers and thought that, but for its larger bill, it would be difficult to separate this form specifically from others, let alone generically.

In *megarhynchus* the long outer tail feathers are fully webbed throughout their length, and, as Tweeddale (1878) very correctly pointed out long ago, from these feathers' being completely webbed to their being partly denuded is but a step, hardly to be considered as sufficient reason for generic separation.

In most of the races of *paradiseus* these feathers are partly denuded, the web disappearing for part of the length of the feather to reappear at the tip on the inner side of the shaft to form the racket. *Dicrurus paradiseus* is monotypic and, except for this modification, is very similar to *hottentottus*. The presence of glossy spangles and hackles in both shows that they are not very far removed. Tweeddale again, in the same paper, as well as other authors, has pointed out that *hottentottus* and *paradiseus* are connected by a transitional race of *paradiseus* (*lophorinus*) in which the web is not denuded, and there are of course no rackets in any plumage; and by another race of *paradiseus* (*ceylonensis*) in which the outer tail feathers are emarginated but in which the shaft is not denuded and therefore does not end in rackets in the immature form. Furthermore, as Tweeddale states (1878, p. 71), "the structure of the outer pair of rectrices is very unstable, the tendency being to revert back to the fully webbed feathers. I have met with examples of *D. brachyphorus*, *D. malabaricus*, *D. platurus* (ex Sumatra), and *D. paradiseus* with the outer pair of rectrices flattened and fully webbed throughout their length, as is always the case in *D. megarhynchus* and *D. lophorinus*."

I have also found occasional similar specimens in my series of *paradiseus* that fully confirm Tweeddale. In these specimens, belonging to the races *brachyphorus*, *platurus*, *otiasus*, and *rangoonensis*, an abnormality in the growth of the tail resulted in fully webbed outer rectrices, or, even when there was no abnormality, the outer rectrices in the adult might be emarginated but lacked the denuded shafts and rackets. As the so-called generic separation of *Dissemurus* from *Dicrurus* rests on the existence of the denuded shafts with their rackets, the instability of this char-

acter, plus the existence of the transitional forms, show that such separation cannot seriously be maintained.

The generic separation of *Bhringa*, also based on the presence of a racket tail, implies a degree of difference that its only species, *remifer*, does not truly possess. For, as in the case of *paradiseus*, it is very closely related to another species of *Dicrurus*, this time *aeneus*. In every character except the racket, such as the intensity of the gloss, general pattern of the plumage, shape and distribution of the glossy feathers, *remifer* and *aeneus* are, except for a modest size difference, almost exactly similar. Further evidence of close relationship is shown by the first year birds; in these the rackets are lacking, the outer rectrices are not elongated, and as a result the tail is normally shaped and has a shallow fork. In view of the fact that the only character by which *remifer* differs from other species of *Dicrurus* is lacking in one stage of its plumage, *remifer* cannot consistently be held to be generically distinct.

CREST

Second only to the tail, the next character that has been used the most for generic segregation is the presence or absence of a crest. But, even within a species, this character is also extremely variable. For instance, in the two polytypic species in which there is a crest (*hottentottus* and *paradiseus*), the crest in intimately related races may be very long or lacking altogether, with all kinds of intermediate variations as to length as well as to incidence.

BILL

The shape of the bill and its feathering have also been used, but in drongos the bill is of a simple, unspecialized pattern. It is strong and can be more or less compressed, or may have a more pronounced or less pronounced downward curve, or the hook at the tip of the upper mandible may be more or less developed, but all these variations are associated with general size. The most compressed bill, and the one that has, relatively speaking, the strongest hook is that of *papuensis*.

The frontal feathers in all drongos are dense and extend to a greater or lesser degree over the upper mandible, the nostril being generally well concealed. Within *hottentottus*, however, there are two or three races in which

the feathering stops short of the nostril, but in other races of the same species the frontal feathers may be prolonged as little plumes which curl forward to a varying degree over the ridge of the culmen, or reduced or lacking, may be replaced by bristles. In view of the variation within this species, the varying length of the frontal feathers has no particular generic significance.

Likewise the length of the rectal bristles. The same variation that exists as to the length of the frontal feathers exists as to the length of the rectal bristles. Generally speaking, the rectal bristles in drongos are well developed and are about from one-half to two-thirds of the length of the bill. *Chaetorhynchus papuensis* is again the only form that shows a significant difference; in this form the bristles project slightly beyond the tip of the bill.

PLUMAGE

The pattern of the plumage, and by this is meant the distribution of the metallic gloss, its intensity, and its restriction or lack of restriction to certain parts of the individual feathers or to certain areas of the whole plumage, is an excellent *specific* character as it varies very little. But unfortunately, however good a character it may be for specific distinction, it cannot be used for generic segregation, for there is a complete scale of gradation from one species to another. The little New Guinea species, *papuensis*, again differs from all the other species in having a concealed white patch on the scapulars.

SUMMARY

All the characters formerly used for generic segregation may vary geographically, even within a species. As a result, the only consistent solution, especially in view of the existence of connecting forms, is to unite all the species in the genus *Dicrurus*, with the exception of *papuensis* for which a separate genus (*Chaetorhynchus*) is admitted.

If it were not for the more primitive character of *papuensis*, as shown by its additional pair of rectrices, it would be difficult to admit this lone aberrant species as a separate genus. Because of the range of variation existing throughout the family, its other characters—the more compressed bill, the longer rectal bristles, and the white scapular patch—do not seem to be too significant.

KEY TO THE GENERA OF DRONGOS

- Tail consisting of 12 rectrices . . . *Chaetorhynchus*
Tail consisting of 10 rectrices . . . *Dicrurus*

ORDER AND SYNONYMY OF THE GENERA

GENUS CHAETORHYNCHUS MEYER

Chaetorhynchus MEYER, 1874, Sitzungsber. Akad. Wiss. Wien, vol. 69, pt. 1, p. 493. Type, by monotypy, *Chaetorhynchus papuensis* Meyer.

GENUS DICRURUS VIEILLLOT

Dicrurus VIEILLLOT, April 14, 1816, Analyse d'une nouvelle ornithologie élémentaire, p. 41. Type, by subsequent designation, *Corvus bali-cassius* Linnaeus (G. R. Gray, 1841, A list of the genera of birds, ed. 2, p. 47).

Edolus CUVIER, Dec. 7, 1816, Le règne animal, vol. 1, p. 350. Type, by subsequent designation, *Lanius forficatus* Linnaeus (G. R. Gray, 1855, Catalogue of the genera and subgenera of birds, p. 58).

Drongo TICKELL, 1833, Jour. Asiatic Soc. Bengal, vol. 2, p. 573. Type, by monotypy, *Drongo caerulescens* Tickell = *Lanius caerulescens* Linnaeus.

Chibia HODGSON, 1836, India Rev., vol. 1, p. 324. Type, by subsequent designation, *Edolus barbatus* J. E. Gray = *Corvus hottentottus* Linnaeus (G. R. Gray, 1841, A list of the genera of birds, ed. 2, p. 47).

Bhringa HODGSON, 1836, India Rev., vol. 1, p. 325. Type, by original designation and monotypy, *Bhringa tectirostris* Hodgson.

Bhuchanga HODGSON, 1836, India Rev., vol. 1, p. 326. Type, by subsequent designation, *Bhuchanga albirictus* Hodgson (Sharpe, 1877, Catalogue of birds in the British Museum, vol. 3, p. 245).

Chaptia HODGSON, 1836, India Rev., vol. 1, p. 326. Type, by monotypy, *Chaptia muscipetoides* Hodgson = *Dicrurus aeneus* Vieillot.

Melisseus HODGSON, 1841, Jour. Asiatic Soc. Bengal, vol. 10, p. 29. New name for *Bhringa* Hodgson.

Cometes HODGSON, 1841, Jour. Asiatic Soc. Bengal, vol. 10, p. 29. New name for *Chibia* Hodgson (not *Cometes* Billberg, 1828).

Dissemurus GLOGER, 1841, Gemeinnütziges Hand- und Hilfsbuch der Naturgeschichte, p. 347. Type, by monotypy, *Cuculus paradiseus* Linnaeus.

Prepopterus BLYTH, 1842, Jour. Asiatic Soc. Bengal, vol. 11, p. 800. New name for *Chaptia* Hodgson.

Musicus REICHENBACH, 1850, Avium systema naturale, pl. 88, fig. 9. Figure of generic details, no species included, cf. Bonaparte, 1854, Compt. Rendus Acad. Sci. Paris, vol. 38, p. 540. Type, by

tautonymy, *Dicrurus musicus* Vieillot = *Corvus adsimilis* Bechstein.

Dicranostreptus REICHENBACH, 1850, *Avium systema naturale*, pl. 88, fig. 12. Figure of generic details, no species included. Type, by subsequent designation, *Edolius megarhynchus* Quoy and Gaimard (G. R. Gray, 1855, *Catalogue of the genera and subgenera of birds*, p. 58).

Trichometopus CABANIS, 1851, *Museum Heineanum*, vol. 1, p. 112. New name for *Chibia* Hodgson.

Balicassius BONAPARTE, 1854, *Compt. Rendus Acad. Sci. Paris*, vol. 38, p. 539. Type, by tautonymy, *Corvus balicassius* Linnaeus.

Entomolestes SUNDEVALL, 1872, *Methodi naturalis avium disponendarum tentamen*, pt. 1, p. 22. New name for *Chaptia* Hodgson.

Dissemuroides HUME, 1872, *Stray Feathers*, vol. 1, no. 1, p. 408. Type, by original designation, *Dissemuroides dicruriformis* Hume.

Dicruropsis SALVADORI, 1878, *Proc. Zool. Soc. London*, p. 88. Type, by subsequent designation, *Dicrurus megalornis* G. R. Gray (Salvadori, 1881, *Ornitologia della Papuasie e delle Molucche*, vol. 2, p. 173).

Dissemurulus OATES, 1889, *The fauna of British India*, vol. 1, p. 322. Type, by original designation and monotypy, *Dicrurus lophorinus* Vieillot.

Dissemuropsis DUBOIS, 1901, *Synopsis avium*, vol. 1, p. 532. New name for *Dissemuroides* Hume.

Dicrachibia HACHISUKA, 1928, *Tori*, vol. 5, no. 25, p. 23 of English sect. Type, by original designation and monotypy, *Chibia menagei* Bourns and Worcester.

This makes a list of 22 generic names for a total of 20 species, 11 of them separate species, and two superspecies with six members in one case and three in the other. The number of 20 for the species is a liberal interpretation, as several of the species included within the two superspecies are very closely related representative island forms (four in the case of the larger superspecies, and one in the case of the smaller).

KEY TO THE DRONGOS (ADULT AND JUVENAL)

1. Tail with 12 feathers *C. papuensis*
Tail with 10 feathers 2
2. Tail with terminal rackets 3
Tail without terminal rackets 4
3. Rackets formed of the inner web
 *D. paradiseus* (part)
Rackets formed of both webs
 *D. remifer* (adult)
4. Tail very long (325-400) *D. megarhynchus*

- Tail shorter (85-200) 5
5. Upperparts gray (slaty to light) 6
Upperparts black 7
6. Abdomen gray *D. leucophaeus*
Abdomen white *D. caeruleus*
7. Underparts not, or not completely, black . 8
Underparts black 9
8. Breast black, abdomen pure white
 *D. balicassius mirabilis*
Breast and abdomen dingy streaked white .
 *D. aldabranus* (juvinal)
9. Quills black 10
Quills rufous *D. fuscipennis*
10. Gloss lacking from the mantle, mantle normally dull or velvety 19
Gloss always present on the mantle . . . 11
11. Crested 12
Not crested 14
12. Crest short and bushy
 *D. paradiseus lophorinus*
Crest long and webbed, or short and hair-like 13
13. Crest consisting of a few hair-like filaments .
 *D. andamanensis*
Crest consisting of webbed feathers
 *D. forficatus*
14. Gloss strong or fairly strong 15
Gloss slight or dull 22
15. Spangles on throat and upper breast well separated and oval shaped 16
Throat and upper breast without spangles, or gloss limited to the tips or terminal edges of the feathers but not separated into distinct spangles 17
16. Fork well developed (18-40) *D. aeneus*
Fork poorly developed (less than 10) or lacking *D. remifer* (juvinal)
17. Fork shallow (3-16) 18
Fork deeper (18-28) *D. annectans*
18. Large, wing 133-156 *D. balicassius*
Small, wing 111-123 *D. atripennis*
19. No hackles or spangles. *D. adsimilis coracinus*
Hackles and spangles present 20
20. Found on Celebes 21
Found outside Celebes *D. hottentottus*
21. Large, wing 158-176 *D. hottentottus leucops*
Smaller, wing 131-144 *D. montanus*
22. Tail long (140-200) 23
Tail short (85-135) 24
23. Very deeply forked (90, average) *D. waldenii*
Less deeply forked (40-65) *D. macrocercus*
24. Larger, wing 119-141 25
Smaller, wing 104-110 *D. ludwigii*
25. Frontal feathers long, tail more deeply forked (31, average) *D. aldabranus* (adult)
Frontal feathers short, tail less deeply forked (20, average) *D. adsimilis*

SYSTEMATIC LIST

Chaetorhynchus papuensis Meyer PAPUAN MOUNTAIN DRONGO

Chaetorhynchus papuensis MEYER, 1874, Sitzungsber. Akad. Wiss. Wien, vol. 69, p. 493. Arfak Mountains.

Monarcha divaga DE VIS, 1897, Ibis, p. 374. Boirave, southeast New Guinea.

General color brownish black. Frontal band pure velvety black, the feathers of the crown glossed with brilliant purplish blue. The rest of the plumage, with the exception of a concealed white scapular patch, glossed with duller steel blue; the metallic reflections becoming very faint or absent on the abdomen and flanks. Remiges, and to a lesser extent the rectrices, fuscous above, grayer and paler below.

Tail slightly rounded, consisting of 12 rectrices which gradually decrease in size from the central pair outward. Bill rather short, stout at the base but strongly compressed laterally from the nostril outward, upper

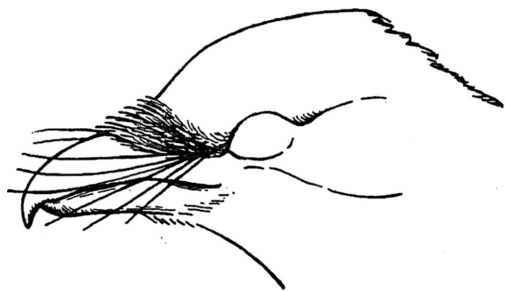


FIG. 3. Head of *Chaetorhynchus papuensis*.

mandible strongly hooked. Rictal bristles very long, projecting beyond the tip of the bill (fig. 3).

SPECIMENS EXAMINED: Western New Guinea: Mansema, 1 ad. ♀. Arfak Mts., no locality, 1 ad. ♂, 1 ad. ♀, 1 subad. ♀; Siwi, 5 ad. ♂, 3 ad. ♀, 1 subad. ♀, 1 imm. ♀, 1 unsexed imm. Wandammen Peninsula, Mt. Wondiwoi, 4 ad. ♂, 1 unsexed ad. Weyland Mts., lower Menoo River, upper Wanggar River, 1 imm. ♂; Mt. Kunupi, 4 ad. ♂, 2 ad. ♀, 1 imm. ♀.

Nassau and Orange Range: Snow Mts., 5 ad. ♂, 1 ad. ♀; Idenburg River, Bernhard Camp, 1 ad. ♂, 4 ad. ♀.

Huon Peninsula: Saruwaged Mts., Sattelberg, 1 ad. ♀; Hompua, 2 ad. ♂, 2 ad. ♀, 3 imm. ♀;

Zakaheme, 1 ad. ♂, 1 ad. ♀; Huambo, 1 ad. ♀.

Eastern New Guinea: Wharton Range, Mafulu, 6 ad. ♂, 1 imm. ♂, 3 ad. ♀; upper Aroa River, 4 ad. ♂, 1 ad. ♀, 1 imm. ♀; head of Aroa River, 1 ad. ♂; head of Mambare River, Bihagi, 3 ad. ♂, 3 ad. ♀. Hydrographer Range, west of Dyke Acland, 3 ad. ♂, 2 ad. ♀, 1 subad. ♀, 2 imm. ♀. Owen Stanley Range, Mt. Gayata, 1 ad. ♂, 1 imm. ♀; Mt. Cameron, 1 ad. ♀, 1 ad. ♀ (?); Babooni, 1 imm. ♀. Yule Island, Hall Sound, 2 ad. ♂. "Bought in Port Moresby," 1 unsexed ad., 1 unsexed imm.

MEASUREMENTS: Length of bill, male, 21.5–24.5 (23.0); female, 20.5–24.0 (22.72). Wing, male, 114.0–127.0 (119.92); female 107.5–125.0 (112.34). C. T. F., male, 94.0–108.0 (100.32); female, 87.0–103.5 (95.18). O. T. F., male 87.5–106.0 (96.35); female, 82.0–100.0 (89.83). Excess of C. T. F. over O. T. F., male, 1.0–9.5 (4.29); female, 1.0–11.0 (5.42).

RANGE: Mountains of all New Guinea—Tamrau (Mayr), Arfak, Wandammen, Weyland, Nassau and Orange, Mamberamo and Sepik (Mayr), Saruwaged, and mountains of southeastern New Guinea and Yule Island.

DISCUSSION: The habitat of this bird, as pointed out by Mayr, is the hill forest from 700 to 1400 meters.

The western populations average larger than those of the southeast. The individual wing measurements of adult males from the two extremes of New Guinea are as follows: western New Guinea (Arfak, Wandammen, and Weyland Mountains), 118, 119, 120, 120, 122, 122.5, 122.5, 123, 123, 123, 125, 127 (122.10); southeastern New Guinea (Wharton and Hydrographer ranges), 114, 115.5, 117, 117, 117, 117.5, 117.5, 118, 118, 118, 119, 119, 121, 122, 122 (118.16). Birds in intervening regions (Saruwaged and Orange and Nassau) are intermediate. In spite of this definite geographical variation, the difference is too small and the overlap too great to allow separation.

In the description of *papuensis* the original author, as well as all subsequent ones, has, strangely enough, overlooked the rather striking fact that this form differs from all other drongos by having an extra pair of tail feathers. The colored plate in Sharpe (1877), as well as the diagram of the spread tail,

depicts a bird with a slightly forked tail made up of 10 feathers.

DICRURUS LUDWIGII

LEAST DRONGO

The Least Drongo has been divided into two supposedly distinct species, a monotypic one (*sharpei*) for the birds of west Africa and the Congo, and another with three races for those of south and east Africa. These races are *ludwigii*, *münzneri*, and *elgonensis*.

Grant and Mackworth-Praed (1942, p. 61) give the ranges of these alleged races as follows: *D. l. ludwigii*, "southeastern-Belgian Congo, northeastern Northern Rhodesia, and southern Nyasaland to eastern Southern Rhodesia, Portuguese East Africa, eastern Transvaal, Zululand and Natal"; *D. l. münzneri*, "southern Italian Somaliland to eastern Kenya Colony and eastern Tanganyika Territory from the Juba River to Mahenge"; *D. l. elgonensis*, "Sudan and north-eastern Belgian Congo to Uganda and western Kenya Colony."

The difference in characters is said to be

that *münzneri* is brighter and more glossy than *ludwigii* and that *elgonensis* is duller than both. Reichenow in his description of *münzneri* said that, in addition to its being more glossy than *ludwigii*, it was also very much larger and had a deeper fork.

Reichenow had only one specimen, a very large male, which measured for the wing 113, O.T.F. 95, C.T.F. not given. Lynes (1934) remeasured the type and gives for the wing 112, O.T.F. 94, C.T.F. 90, so that the "deep" fork is after all only 4 mm.

The individual measurements of my adult specimens from the typical ranges of *münzneri* and *ludwigii* are given in table 1. In this table is included an unsexed adult from Benguela. Although Angola is not given by any author as forming part of the range of *ludwigii*, I have a small series of six specimens from Benguela, only one of which, unfortunately, is fully adult, but which are nevertheless typical *ludwigii*.

It can be seen that there is a slight tendency towards an increase in size from Angola to South Africa and up through east Africa,

TABLE 1
SIZE VARIATION IN *Dicrurus ludwigii*

Locality	Sex	Wing	O.T.F.	C.T.F.	Fork
From the range of <i>münzneri</i>					
Tanganyika, Uluguru Mts.	♂	111	95	87	8
	♀	108	91	84	7
Tanganyika, Rungwe	♂	104	89	83	6
	♂	107	95	87	8
	♀	105	91	86	5
Kenya, Tana River	♂?	109	91	86	5
From the range of <i>ludwigii</i>					
Southern Rhodesia, Melsetter	♂	108	90.5	83	6.5
	♂	107	91	85	6
Northern Rhodesia, Nicutuche	♂	104.5	87	81.5	5.5
	♂	109	91.5	85	6.5
Central Mozambique, Zimbiti	♀	101	86	78.5	7.5
Southern Nyasaland, Mlanje	♀	105	91	84	7
Natal	•	104	90	83	7
Angola, Benguela	•	101	85	80	5

• Unsexed adult.

but the overlap is virtually complete, and there is certainly no significant difference, if any, between birds from southern Rhodesia and Mozambique (*ludwigii*) and those from Tanganyika to Kenya (*münzneri*). I also cannot agree that there is a difference in color or gloss, birds in my series being identical from both regions. In view of the fact that I cannot separate the specimens on either size or color, and I can discern no other differences, I consider *münzneri* to be a synonym of *ludwigii*.

Grant and Mackworth-Praed (1942) say that *elgonensis* is generally duller than *ludwigii*. I have before me the type of *elgonensis*, as well as the paratypes and an additional specimen from Kakamega. They are duller, that is, less glossy, than *ludwigii*, but instead of being "greenish blue black" as their author (van Someren, 1920) described them, they are dull dark purplish blue and, as a matter of fact, I cannot tell them apart from typical specimens of *sharpei* from the Cameroons. I believe therefore, since the difference (less glossy and bluer) is precisely the difference which separates *sharpei* from *ludwigii*, and the birds of western Kenya (Elgon and Kakamega) cannot be separated from typical *sharpei* of west Africa, that *elgonensis* should be made synonymous with it.

This conclusion had already been reached by Macdonald (1946). Examination of the type and paratypes of *elgonensis* and comparison of independent material fully confirm Macdonald, and I further agree that since *sharpei* and *ludwigii* replace each other, there is no excuse for considering them as specifically distinct. The species (*ludwigii*) can be described as follows.

GENERAL DESCRIPTION OF THE SPECIES

Size small (adults: wing, 103–112, tail, 85–95). Entire plumage black, uniformly and very dully glossed with dark purplish blue or dark greenish blue. Tail plainly but very shallowly forked.

Its races are two:

Dicrurus ludwigii sharpei Oustalet

Dicrurus sharpei OUSTALET, 1879, Nouv. Arch. Mus. Paris, p. 97. Upper Ogowé River, Gabon.

Dicrurus elgonensis VAN SOMEREN, 1920, Bull. Brit. Ornith. Club, vol. 40, p. 95. Lerundo (near Kaimosi), western Kenya. (Type in A.M.N.H.)

Gloss dull purplish blue. No white on the inner bend of the wing and no white tips or traces of them on the axillaries.

SPECIMENS EXAMINED: Cameroon: Ja River, 1 ad. ♂; Bitye, 1 ad. ♂, 1 ad. ♀ (?), 1 imm. ♀; Nkongsamba district, 1 imm. ♂, 1 ad. ♀. Lower Congo: Lutete, 1 unsexed ad. Belgian Congo: northeastern Ituri, Djugu, 3 ad. ♀. Western Kenya: Kakamega, 1 ad. ♂; Lerundo, 1 ad. ♂ (the type of *elgonensis*), 1 subad. ♂, 1 ad. ♀, 1 imm. ♀ (the paratypes of *elgonensis*).

MEASUREMENTS: Length of bill, male, 20.0–21.0 (20.80); female, 19.5–22.0 (20.80). Wing, male, 104.5–109.0 (106.60); female, 103.0–106.0 (104.60). C.T.F., male, 80.5–87.0 (83.90); female, 81.0–87.0 (83.10). O.T.F., male, 85.0–92.0 (87.80); female, 85.0–94.0 (88.80). Depth of fork, male, 2.5–5.5 (4.34); female, 4.0–7.0 (5.70).

RANGE: West Africa from Senegal (Sclater) to northern Angola (Bannerman), through the Congo (with the probable exception of the southeast), to southern Sudan (Grant) and western Kenya.

DISCUSSION: A point of difference between the two races which may be of significance is the presence in *ludwigii* of white tips, or traces of them, on the axillaries as well as on the small feathers along the inner bend of the wing. This character is in many species of drongos associated with immaturity, but in *ludwigii* it seems to persist, though to a lesser degree, in specimens that are fully adult. In *sharpei*, according to my specimens, the white is completely absent in both immature and adult plumage. Of 15 specimens of *sharpei* (which include the type and paratypes of so-called *elgonensis*), not one shows any white. In contrast, of 27 specimens of *ludwigii* (including seven from the range of so-called *münzneri*) the white is present in all but one specimen.

Dicrurus ludwigii ludwigii Smith

Edolius ludwigii A. SMITH, 1834, South Africa Quart. Jour., ser. 2, p. 144. Port Natal (Durban).

Dicrurus münzneri REICHENOW, 1915, Ornith. Monatsber., vol. 23, p. 91. Sanji, Mahenge district, Tanganyika. (Type in Berlin Museum.)

Similar to *sharpei* but a little more brightly glossed and with gloss definitely greenish blue rather than purplish blue. Females with

a tendency to be grayer below than the males, whereas both sexes are identical in *sharppei*. White feathers present on the inner bend of the wing, and axillaries tipped with white or showing traces of white tips. The extent of the white varies but is nearly always present.

SPECIMENS EXAMINED: Southern Angola: Benguela, Usolo River near Huambo, 2 subad. ♂; Elandswater (northwest of Cabeça do Lodrão), 1 subad. ♀; Blaasbalkfontein, 1 imm. ♂, 1 imm. ♀, 1 unsexed ad. Natal: no locality, 1 unsexed ad., 1 unsexed imm. Eastern Southern Rhodesia: Mt. Selinda, Melsetter, 2 ad. ♂, 1 imm. ♀. Nyasaland: Mlange, 1 subad. ♂, 1 ad. ♀; Cholo, 1 imm. ♀. Central Mozambique: Zimbiti, 1 ad. ♀. Northern Mozambique: Nicutuche, 2 ad. ♂, 1 subad. ♀; Nacarua, 1 imm. ♀; Suli River, Quenene, 1 subad. ♀. Tanganyika Territory: Rungwe, 2 ad. ♂, 1 ad. ♀; Uluguru Mts., Mkarazi, 1 ad. ♂, Bagilo, 1 ad. ♀; Usambara, Bungu, 1 imm. ♂. Eastern Kenya: Tana River [Kenna-Tana], 1 ad. ♂.

MEASUREMENTS: Length of bill, male, 21.0–22.0 (21.50); female, 21.0–22.5 (21.62). Wing, male, 104.0–111.0 (107.32); female, 101.0–108.0 (104.50). C.T.F., male, 81.5–87.0 (84.18); female, 78.5–86.0 (83.12). O.T.F., male, 87.0–95.0 (90.88); female, 86.0–91.0 (89.75). Depth of fork, male, 5.5–8.0 (6.70); female, 5.0–7.5 (6.63).

RANGE: East Africa from the Juba River in southern Italian Somaliland (Sclater) south through the coastal districts of Kenya, Tanganyika, Mozambique, Natal, and eastern Cape Province, westward to Benguela in southern Angola. Inland to western Tanganyika, southeastern Congo, Nyasaland, and the eastern parts of the Rhodesias and of the Transvaal.

Dicrurus atripennis Swainson

GUINEA FOREST DRONGO

Dicrurus atripennis SWAINSON, 1837, Birds of West Africa, vol. 1, p. 256. Sierra Leone.

Frontal band and ear coverts velvety black, the rest of the entire body plumage strongly and uniformly glossed with steel green, becoming a little duller on the underparts. The gloss occasionally shows slight purplish reflections in certain lights. Tail plainly but not deeply forked.

SPECIMENS EXAMINED: Upper Guinea Forest. Sierra Leone: Sulymah River, 1 ad. ♂; Kuma

Forest, 1 ad. ♂ (?); Sugarloaf Forest, 1 ad. ♀; York Pass, 1 imm. ♀. Liberia: Dukwia River district, 1 ad. ♂, 1 unsexed ad. Gold Coast: Winimebah, 1 ad. ♂.

Lower Guinea Forest. Southern Nigeria: Degema, 1 ad. ♂. Cameroon: Sakbayeme, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Efoulen, 1 ad. ♂; Bipindi, 1 ad. ♂; Ja River, 1 ad. ♂. Gabon: Enchebafalla, 4 ad. ♂; Abanga, 1 ad. ♀; Ogowé River, Umpolosa, 1 ad. ♀. Belgian Congo: Middle Congo River, Lukolela, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Bomokandi, Rungu, 1 ad. ♂; Stanleyville district, Batama, 1 ad. ♂; Ituri: Avakubi, 1 ad. ♂, 2 ad. ♀; Penge, 1 ad. ♂; N'Gayu, 2 ad. ♂, 2 ad. ♀, 1 subad. ♀; Medje, 1 ad. ♀, 1 nestling ♂; eastern Congo: Angumu, 4 ad. ♂, 1 imm. ♂, 2 ad. ♀, 2 imm. ♀; "50 kms. from Irumu on road to Beni," 1 ad. ♀; "25 Ms. SW of Irumu on road to Beni," 1 imm. ♀; "near Beni," 1 nestling ♂.

MEASUREMENTS: Length of bill, male, 22.0–24.5 (23.29); female, 22.0–25.0 (23.04). Wing, male, 111.0–123.5 (116.54); female, 109.5–120.0 (114.77). C.T.F. male, 85.5–93.0 (89.25); female, 86–98 (87.67). O.T.F., male, 94.0–103.0 (98.65); female, 92.0–102.0 (97.15), another 109.0. Depth of fork, male, 6.0–15.0 (9.73); female, 5.0–11.0 (7.64).

RANGE: The Upper and Lower Guinea Forests, from Sierra Leone on the west down to the Gabon and eastward to the Semliki Valley.

DISCUSSION: Our specimens show no difference between the birds of the Upper and Lower Guinea Forests.

The species is apparently strictly limited to the virgin forest, and its range on the west does not extend any farther than Sierra Leone. A skin, supposedly of this species, has been recorded by Budgett (1901) from Gambia, but Bannerman (1939, p. 332), speaking of this specimen, states, "... the specimen is that of *D. sharppei*. Budgett's collection was named by Shelley and that authority considered *D. atripennis* and *D. sharppei* to be synonymous, a conclusion which we now know to have been incorrect."

Similarly speaking of another region, Chapin (in MS) states, "Dubois' alleged occurrences in the Katanga and near Lake Tanganyika are certainly erroneous, the species scarcely ranges beyond the border of unbroken rain-forest. His specimens may have been *D. ludwigii*."

All the authors familiar with the habits of

atripennis say that it usually plays the leading part in the mixed bird parties that roam the forest in search of food. Such companies, called "éjak" by the natives, are described by Bates (1905) whose account, quoted by Bannerman (1939, p. 332), refers to our bird as follows: "Nearly all the forest species of birds feed in this way, more or less. Each éjak contains individuals of from three or four to eight or ten species. Nearly always two or three of the Black Drongo (*Dicrurus atripennis*) are the most conspicuous birds of the éjak." In contrast to this social behavior with other species, *atripennis* "never flocks with its own kind" (Chapin, in MS).

SUPERSPECIES ADSIMILIS

The common drongos of India (*macrocerus*) and of Africa (*adsimilis*) were made conspecific as early as 1877 by Sharpe (1877, p. 248) who states that *macrocerus* is "nothing but a larger race of the African Drongo." But this view was ahead of the times, and Sharpe was criticized by Tweeddale (1878, p. 74), who in his review of the arrangement of the Dicruridae in the "Catalogue of birds" places them in separate genera, insisting that the two are "totally distinct." No one followed Sharpe, and it was left to Deignan (1945) to revive his view by again making them conspecific.

The two groups (*adsimilis* and *macrocerus*) are geographical representatives and, far from being "totally distinct," are very close to each other. Both are similar in the appearance and pattern of their plumage, a character which (as I have pointed out above in the section on the genera) I consider to be of fundamental importance in the Dicruridae. Both are lustrous black; their rather dull gloss is not restricted to certain parts of the feathers but is uniform in distribution. In both, the wing linings are pale, and in both the immatures are copiously marked with white below. One or two of their respective races depart from these characters but are well connected back into the prevailing pattern by intergrading forms.

There is, however, a certain degree of difference between the two groups which suggests that reproductive isolation may have developed. In all the races of *macrocerus* there is a white spot at the angle of the gape; this

rectal spot is often minute and tends to disappear but is never entirely absent, whereas in *adsimilis* it is never present. Of more importance is a difference in proportions. In the *adsimilis* group the tail is always very definitely shorter than the wing, whereas in the *macrocerus* group the reverse is the case. In the five races of *adsimilis* the length of the tail averages in round figures 86 per cent of the length of the wing; in the seven races of *macrocerus* this proportion averages 109 per cent, an over-all difference of 23 per cent between the two. Associated with this is the depth of the fork, which in *macrocerus* is from two to more than three times as deep. All these differences may not be of fundamental importance, but they are at least suggestive.

To "lump" both groups together would obscure the degree of difference between them. On the other hand to list them in one superspecies rather than as ordinary species highlights the importance of the relationship between the two groups while not obscuring in any way that of the races. Also from a standpoint of pure convenience, I believe it is desirable to keep the African and Asiatic races separate.

In the same superspecies I include four additional forms from the western Indian Ocean. They are *D. fuscipennis* from Grand Comoro, *D. aldabranus* from the Aldabras, *D. forficatus* from Madagascar and Anjouan, and *D. waldenii* from Mayotte. All are similar in plumage to *adsimilis* and *macrocerus* and have the proportions of both. They might be considered as subspecies if it were not for such a curious mixing of characters, and the fact that some of them have developed independent characters, such as a crest in *forficatus*. *D. waldenii* is very strikingly close to the Asiatic *macrocerus*, *fuscipennis* is much closer to the African *adsimilis*, *forficatus* is a crested *adsimilis*, and *aldabranus* is a combination of the characters of the last two.

Under the circumstances I think it is probably better to maintain these four well-marked insular forms as separate species. But they must, however, be included in a single superspecies along with *adsimilis* and *macrocerus*, since their relationships and affinities are very clearly to both.

The superspecies *adsimilis* should be arranged in the following order, which seems to represent best its affinities:

1. *Dicrurus adsimilis* with its five races, Africa
2. *Dicrurus fuscipennis*, Grand Comoro Island
3. *Dicrurus aldabranus*, Aldabra Islands
4. *Dicrurus forficatus* with its two races, Madagascar and Anjouan Islands
5. *Dicrurus waldenii*, Mayotte Island
6. *Dicrurus macrocercus* with its seven races, Asia

DICRURUS ADSIMILIS AFRICAN DRONGO

The two species (*adsimilis* and *modestus*) into which the various forms of the African Drongo were formerly divided were united by Bates (1933, p. 177) because, as he pointed out, in west Africa "There is a very perfect gradation, with scarcely perceptible differences, between the Glossy-backed Drongo [*adsimilis*] of the drier parts of Africa and the Velvet-mantled Drongo [*modestus*] of the Main Forest."

The new arrangement was accepted by Bannerman (1939, p. 328) who, giving additional reasons why the two should be united, states, "Contrary to the view expressed by me in Ibis, 1920, p. 440, I have now reluctantly accepted the new arrangement of the African Drongos as proposed by Bates in which he makes *coracinus* and *modestus* subspecies of *adsimilis*, rather than keeping the first two distinct. The Principe Island bird (*modestus*) has less of a velvet back than the Lower Guinea *coracinus*, approaching in plumage more closely the all glossy mantle of *adsimilis* and *atactus*. In support of Bates' argument in considering all these Drongos as forms of *adsimilis* it must be allowed that birds from Lagos and Badagri districts of Southern Nigeria (where the two forms meet) show a mixture of characters of *atactus* and *coracinus*, it being difficult to determine to which race certain individual specimens belong. Formerly *coracinus* was considered a race of *modestus* and *atactus* a race of *adsimilis*."

Examination of the material in the American Museum consisting of a very good series of 434 specimens confirms these views. I can differ in only one respect. That is, Bates does not believe that the birds inhabiting the

drier parts of the continent north of the rain forest (*divaricatus*) can be separated from those south and east of the forest (*adsimilis*). My measurements, however, show that the two are easily separable. If only the wing length is taken, which I believe to have been the only measurement so far considered, Bates is correct in that *divaricatus* is not separable from *adsimilis*, all the populations intergrading. But if the depth of the fork be taken, the birds north of the forest are distinct, in that they have a shallower fork averaging only about half the depth of that of the others. The range in depth for six populations north of the forest is, for adult males, only 11.0–15.66 (12.60) and for nine populations south of the forest ranging from Angola through South Africa and up the east coast 19.0–25.75 (22.87). The population in the latter having the smallest average depth (19.0) occupies the Uganda and Kenya highlands, where *adsimilis* passes into *divaricatus* and the only place where the two could come together, elsewhere being separated by the rain forest.

Another important finding is the existence of a whole chain of isolated specimens around the forest which are indistinguishable from specimens of the race (*atactus*) which in Upper Guinea connects the glossy-backed form to the velvety-mantled form. Bannerman, as already cited, had noticed that intergrades were found in southern Nigeria. We have found birds showing a mixture of characters of *adsimilis* and *coracinus* at Barraca on the lower Cuanza River in northern Angola, at Baraka and west of Baraka on the northwestern shore of Lake Tanganyika, on the lower Ruzizi River and at Niangara in the Uele. All these specimens cannot be distinguished from others of *atactus* from Upper Guinea; all are identical in color, measurements, and the amount of gloss on the mantle.

We would expect that as we skirt the forest we would continue to find more of these specimens. However, with the exception of the bird from Niangara, our other specimens from the eastern Congo and those from Uganda and Kenya are always clearly either those with the velvety dull back (*coracinus*) or those with the glossy back (*adsimilis*). Dr. James P. Chapin furthermore tells me that the ecological separation is sharply

marked, *coracinus* never leaving the forest while *adsimilis* and *divaricatus* never enter it. In view of this sharp delimitation there seemingly would be no opportunity for intergradation. That it nevertheless does occur there is shown by our specimen from Niangara where gallery forests extend into the savanna. It is also shown by two specimens from the Ruzizi Valley. One of these I cannot distinguish from *atactus* of Upper Guinea, and I have referred it to this form. The other, from Luvungi, while closer to *coracinus*, begins to depart from it. This specimen was collected by Chapin who was much surprised to find a *coracinus* at that locality where only scrubby patches of forest occur. I mention this to show that *coracinus* apparently sometimes leaves the rain forest.

I have dwelt at some length on this subject because, while apparently at the eastern end of the forest the glossy (*adsimilis* and *divaricatus*) and the dull (*coracinus*) birds tend to behave as separate species, there are exceptions which show that they cross often enough to prove that they are not yet completely isolated reproductively. In Upper Guinea the exceptions have become the rule and there the hybrid race (*atactus*) is well established; elsewhere it is not well established and continues to occur as a chain of isolated specimens around the edge of the forest.

Grant and Mackworth-Praed (1942, p. 61) believe that *adsimilis* and *modestus* should have been kept as separate species because "both are found in Uganda and western Kenya Colony." The local form of *modestus* (*ugandensis*) is only reluctantly recognized by Jackson and Sclater (1938, p. 1171) as being "hardly separable," and is rejected emphatically by Bannerman (1922) as being indistinguishable from *coracinus* of west Africa—a conclusion with which I fully agree.

All my specimens of *D. a. coracinus* from Uganda and western Kenya were collected in areas where isolated patches of forest occur; the localities recorded by Jackson and Sclater for *ugandensis* are also in forest. On the other hand, all my localities, as well as those of Jackson and Sclater, for the glossy-backed form are in open, unforested areas with considerable grassland.

I cannot therefore accept the view of Grant

and Mackworth-Praed, for when the situation is really studied it is apparent that, even though both the glossy and dull backed forms are found in Uganda and western Kenya, they do not really occur together.

MEASUREMENTS

The following is a list of the individual wing measurements and depth of the fork of the adult specimens in my series of *adsimilis*, *divaricatus*, and *atactus*. The individual measurements in *coracinus* and *modestus* are not given, as the former is easily separable by the lack of gloss on the mantle, and the latter, though resembling *coracinus*, is considerably larger and is restricted to Principe Island.

Dicrurus adsimilis adsimilis:

Luanda. Wing: males, 128, 130.5, 132, 136 (131.62); females, 135, 136. Fork: males, 22.5, 23.5, 26.5, 27 (24.90); female, 25.

Benguela. Wing: males, 138, 139, 139, 140, 140, 140, 140, 141, 143 (140.0); females, 130.5, 133, 136, 136.5, 141 (135.40). Fork: males, 17, 23, 24, 24, 24.5, 25.5, 26, 27 (23.88); females, 20, 21, 22.5, 25, 28 (23.50).

Bechuanaland. Wing: males, 130, 132.5, 139.5 (134.0). Fork: males, 20.5, 21, 21.5 (21.0).

Southeast Africa. Wing: males, 130.5, 131, 131, 132.5, 133, 133, 135.5, 136.5, 139 (133.55); females, 128, 129.5, 131, 131, 132.5 (130.40). Fork: males, 15, 20, 20.5, 22.5, 23, 25, 26, 29 (22.12); females, 20, 21, 21, 23, 26 (23.0).

Southern Nyasaland (Lake Chilwa and Shiré River). Wing: males, 128, 129. Fork: males, 24, 27.5.

Northern Mozambique. Wing: female, 123. Fork: female, 21.

Katanga and Northern Rhodesia. Wing: males, 135, 135, 141 (137.0); females, 136, 136, 137 (136.33). Fork: males, 23, 30, 31 (28.0); females, 21, 24, 29 (24.66).

West of Lake Tanganyika (Moba). Wing: males, 134, 137, 138 (136.33); female, 122.5. Fork: males, 24, 25, 27 (25.33); female, 19.

Tanganyika highlands (from Kilimanjaro to Kilosa). Wing: males, 120, 121, 123, 126, 127, 128, 129.5 (124.93); females, 129, 130. Fork: males, 19.5, 21, 22, 22, 22, 24, 24.5 (22.12); females, 20, 20.

Karagwe and Ruanda. Wing: males, 128, 130, 130, 132, 134, 135, 137 (132.29); females,

128, 129, 129, 130, 131, 132 (129.84); Fork: males, 18, 18, 18, 21, 21, 22, 24 (20.66); females, 13, 17, 19.5, 20.5, 21.5, 23 (19.08).

Uganda and Kenya highlands. Wing: males, 119, 119.5, 122, 122.5, 126, 126, 126, 126, 126, 126.5, 127, 127, 128, 130, 132 (125.70); females, 120, 124, 126, 131, 131 (126.40). Fork: males, 15, 15, 16, 16, 18, 19, 20, 21, 21.5, 21.5, 26 (19.0); females, 11.5, 14, 22 (15.83).

Coast (up to 2000 feet, from Tanga to Kipini). Wing: males, 121, 126, 127, 128, 130 (126.40); females, 118, 121, 121, 124, 125 (121.80). Fork: males, 18, 20, 21, 22, 24, 24.5, 25 (22.07); females, 16, 19, 22, 25 (20.50).

The figures show slight local differences; the smallest birds are those of the Uganda,

Abyssinia (Gurafarda Range and Herer River region). Wing: males, 126, 130, 130.5 (128.83); females, 122, 122, 122, 122, 124.5, 130 (123.75). Fork: males, 12, 12, 13 (12.33); females, 7, 9, 9, 11, 12, 14 (10.33).

Abyssinia (Maraco region). Wing: males, 124.5, 126, 128, 128.5, 129, 130, 130.5, 133, 136 (129.50); females, 123, 123, 124, 124.5, 126, 127, 127, 127.5, 130 (125.78). Fork: males, 10.5, 12, 12, 12.5, 13, 13.5, 16, 19 (13.56); females, 8, 10, 10, 10, 11, 12.5, 13.5, 15, 15 (11.66).

Although this series of *divaricatus* is remarkably uniform, it shows that the birds in Somaliland at the other extreme of the range from Senegal average smaller and that

TABLE 2

COMPARATIVE MEASUREMENTS OF ADULT MALES IN THE RACES OF *Dicrurus adsimilis*
(Means are in parentheses)

Race	N	Wing Length	N	Tail Length (O.T.F.)	N	Depth of Fork
<i>D. a. adsimilis</i>	65	119.0-143.0 (130.87)	61	102.5-126.0 (112.77)	61	15.0-29.0 (22.04)
<i>D. a. divaricatus</i>	35	122.0-136.0 (128.40)	31	99.0-118.0 (107.91)	31	8.0-20.0 (12.87)
<i>D. a. atactus</i>	7	129.0-140.0 (132.85)	7	110.0-123.0 (115.91)	7	20.0-29.0 (24.33)
<i>D. a. coracinus</i>	42	122.0-138.0 (130.56)	34	104.0-122.0 (113.69)	34	15.0-30.0 (22.65)
<i>D. a. modestus</i>	14	134.5-141.0 (138.61)	14	119.0-135.0 (126.40)	14	16.0-24.0 (19.53)

Kenya, and Tanganyika highlands, and the largest are found at the other end of the range in Benguela. On the whole the increase is from north to south and east to west, but there are many intergrades between the various populations.

Dicrurus adsimilis divaricatus.

Senegal. Wing: males, 125, 128.5, 130, 130, 130, 133, 136 (130.36); females, 122, 123, 126 (123.66). Fork: males, 13, 14, 15, 16, 16, 20 (15.66); females, 13, 15.

Uele. Wing: males, 123, 127, 128.5, 130.5 (127.25); females, 125, 125. Fork: males, 8, 12, 14 (11.33); females, 9.5, 12.

Sudan. Wing: males, 125, 127, 127.5, 128, 128.5, 132.5 (128.08); females, 121, 123, 125 (123.0). Fork: males, 8, 9, 10.5, 13, 13, 17 (11.75); females, 11, 12.

Eritrea. Wing: male, 132.5; female, 127.5. Fork: male, 13.5; female, 11.

Somaliland. Wing: males, 122, 124, 125, 125.5, 126.5, 128 (125.16); females, 121, 125. Fork: males, 9.5, 10.5, 11, 11, 13 (11.0); female, 12.

there is a continuous trend from west to east in the reduction in length of the wing. The measurements (of both *adsimilis* and *divaricatus*) also show that if only the wing length is considered, one could agree with Bates and consolidate all the birds of the drier parts of Africa as *adsimilis* and give the range as one enormous loop around the rain forest. I have, however, and for the reason already discussed (a deeper fork), drawn the line somewhere between Somaliland and the Uganda-Kenya highlands, placing the birds from the latter into *adsimilis*.

Dicrurus adsimilis atactus.

Sierra Leone. Wing: male, 135; females, 128, 129, 130, 131 (129.50). Fork: male, 23; females, 14, 15, 18, 19 (16.50).

Liberia. Wing: female, 130. Fork: female, 23.

Northern Angola. Wing: male, 130. Fork: male, 24.

Baraka. Wing: males, 129, 133, 140 (134.0); female, 133. Fork: males, 23, 27, 29 (26.34); female, 26.

Lower Ruzizi River. Wing: male, 132. Fork: male, 20.

Niangara, Uele. Wing: male, 131. Fork: male, 20.

The comparative measurements of the adult males in the five races of *D. adsimilis* are given in table 2.

The measurements in table 2 show that *divaricatus* is slightly smaller and has, on an

average, a considerably shallower fork, and that *modestus* is larger, particularly as regards the tail. The other three races are not separable from one another on the basis of measurements; the separation in their case is on the amount of gloss on the mantle, or its lack.

SUMMARY

I recognize only one species (*adsimilis*), with five races. A brief statement of their

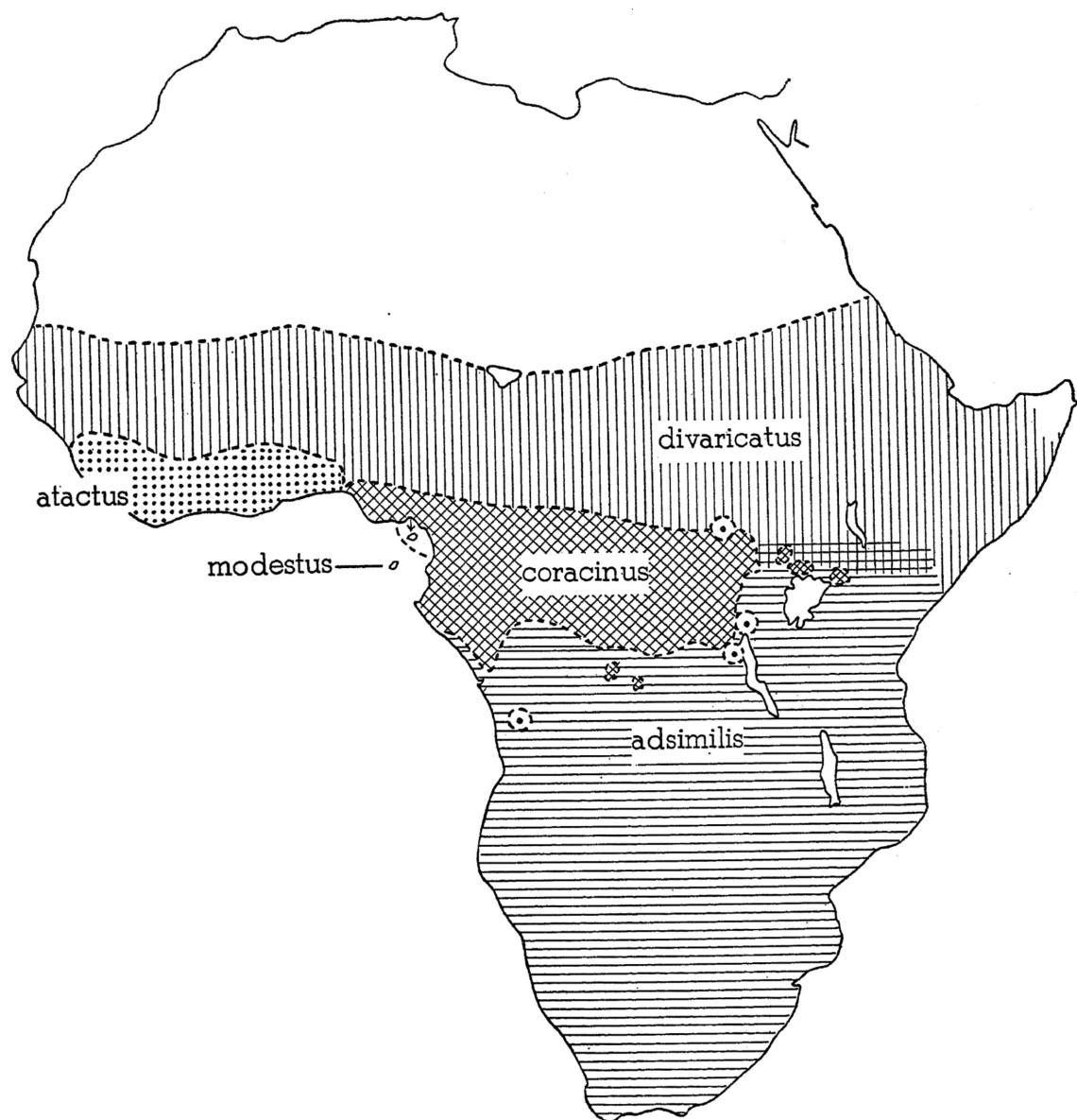


FIG. 4. Distribution of *Dicrurus adsimilis*. The circles with a dot in their center show the location of the isolated specimens of *D. a. atactus*.

chief distinguishing characters and ranges, as well as a general description of the species as a whole, can be given, as follows:

Dicrurus adsimilis adsimilis: glossy back, deeper fork; the whole of Africa south of the rain forest, intergrades with *divaricatus* in northern Kenya and Uganda.

D. a. divaricatus: glossy back, shallow fork; north of the rain forest from Senegal to southern Italian Somaliland.

D. a. coracinus: dull velvety back; the rain forest from Lagos to the forests of Uganda and western Kenya, and the island of Fernando Po.

D. a. atachus: back intermediate between the gloss of *adsimilis* and *divaricatus* and the dull velvet of *coracinus*; small patches of forest on the fringes of the rain forest from Sierra Leone to Lagos, and as a chain of isolated specimens along the border of the rain forest.

D. a. modestus: mantle near that of *coracinus*, but with a slight amount of gloss, larger than the others; Principe Island.

The ranges of these five races are shown on figure 4.

GENERAL DESCRIPTION OF THE SPECIES

Plumage deep lustrous black, glossed uniformly on the top of the crown, wing coverts, and top of the tail with dull steely greenish blue. The mantle and the underparts varying from glossy to dull and velvety. Frontal band and lores dull velvety black. The lining of the wings pale and silvery, changing to dark. Immatures less glossy, barred below to a varying degree with whitish or buff and with small white feathers along the inner bend of the wing. Tail moderately or shallowly forked with the outer rectrices curving slightly outward.

Dicrurus adsimilis adsimilis Bechstein

Corvus afer LICHENSTEIN, 1793 (not *Corvus afer* Linnaeus, 1766), *Catalogus rerum naturalium rarissimarum*, Hamburg, p. 10. South Africa.

Corvus adsimilis BECHSTEIN, 1794, Johann Latham's *Allgemeine Uebersicht der Vögel*, vol. 2, pt. 1, p. 362. South Africa.

Dicrurus musicus VIEILLLOT, 1817, *Nouveau dictionnaire d'histoire naturelle*, nouvelle édition, vol. 9, p. 586. Cape of Good Hope.

Muscicapa emarginata LICHENSTEIN, 1823,

Verzeichniss der Doubletten Zooligischen Museums . . . Berlin, p. 52. Caffraria.

Dicrurus fugax PETERS, 1868, *Jour. für Ornith.*, vol. 16, p. 132. Tete and Inhambane.

The specific name *Corvus afer* of Lichtenstein was used by Reichenow in "Vögel Africas" but, as Oberholser (1905) has shown, Lichtenstein merely misidentified a South African bird as *Corvus afer* of Linnaeus (1766, *Systema naturae*, ed. 12, vol. 1, p. 57), though with a query.

Entire plumage glossed uniformly with dull steely greenish blue. Primaries with outer webs dark while the inner webs are lighter and grayish brown. The lining of the wings pale silvery warm gray, darkening at the tips.

SPECIMENS EXAMINED: Northern Angola: Luanda: lower Cuanza River, Barraca, 1 imm. ♂; lower Cuanza, Dondo, 2 imm. ♀; Cuanza River, Sagua, 2 unsexed imm.; Canhoca, 2 ad. ♂; Pungo Andongo, 1 ad. ♂, 1 ad. ♀; Duque de Braganza, 1 ad. ♂, 1 ad. ♀, 1 unsexed ad.; Luxillo, near Duque de Braganza, 1 juv. ♀.

Southern Angola: Benguela: Capelongo, 3 ad. ♂, 1 ad. ♀; Luvando, 1 ad. ♂, 1 ad. ♀; Silva Porto, 1 ad. ♂; Huambo, 1 ad. ♀; Mombolo, 1 ad. ♂; Chipopia, 1 imm. ♀; Bongo River, 1 ad. ♂; Candumbo, 1 ad. ♂; Cutato River, 1 imm. ♀; Elandswater, 1 ad. ♀; Kalai River, 1 imm. ♂; Caiala, 1 ad. ♀; Bulu-Bulu, 1 juv. ♂; Chissamba, 1 imm. ♀; Chiyuké, 1 ad. ♂; Pedreira, 1 imm. ♂; 1 imm. ♀.

Bechuanaland: Tsotsoroga, 1 ad. ♂, 1 imm. ♂; Ngamiland, Maun, 1 ad. ♂; southern Kalahari, Kuké, 1 ad. ♂.

Union of South Africa: Cape Colony: no locality, 1 ad. ♂; Kowie River, near Port Alfred, 1 ad. ♂; Kingswilliamstown, 2 unsexed ad., 1 unsexed imm. Natal: Ifafa River, 1 unsexed imm.; Etshowe, 1 ad. ♀; Umzumbe Mission, 1 unsexed ad. Transvaal: Rustenburg, 2 ad. ♂; Hamanskraal, 1 imm. ♂; Barberton, 1 ad. ♂, 1 imm. ♀; Zoutpansberg district, Klein Letaba, 1 ad. ♂, 1 ad. ♀; Limpopo River, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀; 1 unsexed imm.

Southern Rhodesia: No locality, 1 unsexed imm.; Wedza, 1 ad. ♂; Bulawayo, 1 ad. ♂, 2 ad. ♀; Manzamnyama River, 1 ad. ♂, 1 imm. ♂.

Southern Nyasaland: Lake Chilwa, 1 ad. ♂; Fort Johnston, 1 imm. ♀; upper Shiré River, 1 ad. ♂, 3 imm. ♀.

Northern Mozambique: Nicutuche, 1 subad. ♀, 2 imm. ♀, 1 unsexed ad.; Lalaua, 1 ad. ♀.

Northern Rhodesia: Lake Mwange, west of Balovale, 1 ad. ♀; Mwinilunga district, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 2 imm. ♀.

Tanganyika Territory: Kilosa, 1 ad. ♂; Mkaramo, 1 ad. ♂; Bubufuss, Irangi River, 1 ad. ♀; Begu, 1 ad. ♂; Kissaki, 1 subad. ♀; Makindu [?], 1 imm. ♀; Tukuyu, 1 imm. ♂, 1 imm. ♀; Mwanasomano, south of Tabora, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Moshi, 3 ad. ♂; Mt. Longido, 1 unsexed ad.; Mbulu, 1 ad. ♀.

Southeastern Belgian Congo: Moba, 3 ad. ♂; Kinia, Marungu Mts., 1 juv. ♂, 1 imm. ♂, 1 ad. ♀; northern Katanga, 1 ad. ♂, 1 ad. ♀.

Karagwe and Ruanda: Usvu, 1 ad. ♂; south of Urigi Lake, 1 ad. ♀; Urigi Lake, 2 ad. ♂, 1 juv. ♂, 3 ad. ♀; Kitengule, 3 ad. ♂; Nsaza, 1 ad. ♀; between Nsaza and Kagera River, 1 ad. ♂, 1 ad. ♀, 2 juv. ♀.

Uganda: Kimiriri River, near Mt. Elgon, 1 juv. ♂; Sironko River, near Mt. Elgon, 1 subad. ♂; Moroto, 1 imm. ♀; Kikanja, "5 days east of Fort Portal," Toro, 1 ad. ♂; Kitagwetoa, "4 days east of Fort Portal," Toro, 1 subad. ♀; Kampala, 1 ad. ♀.

Kenya Colony: Southern bank of northern Waso Nyiro River, 1 ad. ♂; Waso, 1 imm. ♂; Marsabit, 1 ad. ♂, 1 subad. ♀; Barsaloi, 1 ad. ♂, 1 subad. ♂; Kerio River, south of Lake Rudolph, 1 ad. ♀; Archer's Post, 1 subad. ♂, 1 subad. ♀; Meru, 3 ad. ♂; Tana-Kenna, 1 ad. ♂, 1 imm. ♀; Mt. Kenya, "above Chuka," 1 ad. ♂, 1 ad. ♀; Fort Hall, 2 ad. ♂, 2 imm. ♂, 1 subad. ♀; Kikuyu, 1 unsexed nestling; Kitui, 1 ad. ♂, 1 subad. ♀; Sultan Hamud, 1 imm. ♂; Simba, 2 ad. ♂, 1 subad. ♂, 1 subad. ♀; Escarpment, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀, 4 imm. ♀; Neng, 1 imm. ♀; Kisumu, 1 ad. ♂, 1 imm. ♀; Nzoia River, 1 ad. ♀; Kendu Bay, 1 subad. ♂, 1 ad. ♀.

Coast of northern Tanganyika and of Kenya up to 2000 feet: Tanga, 1 ad. ♂; Dar es Salaam, 1 ad. ♀; Changamwe, 2 ad. ♂, 2 subad. ♂; Mombasa, 1 ad. ♂, 1 ad. ♀; Mazeras, 1 imm. ♀; Sagala, Teita Hills, 1 subad. ♂; Tsavo, 2 subad. ♂; Maungu, 1 ad. ♂; Roka, near Malindi, 2 ad. ♂, 1 imm. ♂, 2 ad. ♀; Kipini, 1 ad. ♀, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 22.0–25.5 (23.62); female, 21.0–25.0 (23.35). Wing, male, 119.0–143.0 (130.87); female, 118.0–136.5 (129.40). C.T.F., male, 82.0–102.0 (91.52); female, 79.0–98.0 (90.14). O.T.F., male, 102.5–126.0 (112.77); female, 99.0–123.0 (110.87). Depth of fork, male, 15.0–29.0 (22.04); female, 11.5–29.0 (20.87).

RANGE: The whole of Africa south of the rain forest and extending on the east to include Uganda and Kenya outside the forests. Intergrades with *divaricatus* in northern Kenya and Uganda.

DISCUSSION: The birds of coastal east

Africa were separated by Peters in 1868 as *fugax*, type locality Tete and Inhambane, and other authors have included under this name all coastal birds from southern Kenya to Inhambane on the basis of averaging smaller. Friedmann (1937) does not agree that *fugax* is a valid race. He gives the wing length of a series from Changamwe as: four males, 123.5–129.0, 10 females, 110.5–132.0, stating that the inland birds are not larger. The measurements of our material bear out his findings, and I agree with Friedmann that *fugax* is not valid. The wing length of our coastal adult males is: Tanga, 128.0, Changamwe, 121.0, 128.0, Roka, near Malindi, 126.0, 130.0; average of five adult males (126.40). Our inland birds in Uganda and Kenya measure: 15 adult males, 119.0–132.0 (125.70). Other inland birds in Tanganyika from south of Kilimanjaro to Kilosa, seven adult males, 120.0–127.0 (124.93).

Dicrurus adsimilis divaricatus Lichtenstein

Muscicapa divaricata LICHTENSTEIN, 1823, Verzeichniss der Doubletten Zoologischen Museums . . . Berlin, p. 53. Senegambia.

Edolius lugubris HEMPRICH AND EHRENBURG, 1828, Symbolae physicae, Aves, fol. s, pl. 8, fig. 3. Ambukol, Dongola, Nubia [Anglo-Egyptian Sudan].

Dicrurus canipennis SWAINSON, 1837, Birds of West Africa, vol. 1, p. 254. Senegal.

Dicrurus aculeatus CASSIN, 1851, Proc. Acad. Nat. Sci. Philadelphia, p. 348. Fazogloa, E. Africa [Fazogli, hill across from Famaka on Blue Nile, Anglo-Egyptian Sudan].

Edolius erythrophthalmus HEUGLIN, 1867, (Württemberg Manuscript), Jour. für Ornith., vol. 15, p. 294. Senaar and Fazogl [Sennar and Fazogli, Anglo-Egyptian Sudan].

Dicrurus adsimilis jubaensis VAN SOMEREN, 1931, Jour. East Africa and Uganda Nat. Hist., no. 37, p. 196. Juba River, upper reaches.

Similar to *adsimilis* but tail with a shallower fork.

SPECIMENS EXAMINED: West Africa: Senegal: Thiés, 6 ad. ♂, 1 ad. ♀, 1 imm. ♀; upper Casamance, 1 ad. ♂, 2 ad. ♀. Gold Coast hinterland: Gambaga, 1 ad. ♀ (?). Northern Nigeria: Zaria Province, 1 ad. ♀, 1 unsexed ad.; Hausaland, Kano, 1 unsexed ad.

Northeastern Belgian Congo: Uele, Faradje, 4 ad. ♂, 1 imm. ♂, 2 ad. ♀, 1 subad. ♀, 1 imm. ♀; Vankerckhovensville, 1 imm. ♂.

Sudan: Upper White Nile, Lado Kodo, 1 ad. ♂; Gondokoro, 2 imm. ♀; Bahr el Ghazal, 2 ad. ♂, 1 subad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀; Akona, near Jebel, 1 imm. ♀; White Nile, Kaka, 1 ad. ♀, 1 imm. ♀; West Hedeida ferry on Rahad River not far from Medani, 1 ad. ♂, 1 subad. ♀; near Medani, 1 ad. ♂, 1 subad. ♀, 2 imm. ♀; Blue Nile, Roseires, 1 ad. ♂, 1 imm. ♂; Barankwa, 1 imm. ♀; 1 unsexed ad.

Eritrea: Salama, 1 ad. ♂; Mai Dulue, 1 ad. ♀; Valle di Ghinda, 1 imm. ♀.

British Somaliland: Eil Huma, 1 ad. ♂; Wadi Merso, 1 ad. ♀; Wagar, near Sheikh, 6 ad. ♂, 3 imm. ♂, 2 imm. ♀; Sibbe, 1 ad. ♀.

Abyssinia: Gurafarda Range: Binescho, Mt. Faka, 1 ad. ♀; Schekho, 2 ad. ♀; Detschabassa, 1 ad. ♂, 1 ad. ♀. Herer River region: (most of the following localities were not found but they seem to be along or near the Herer River east of Ankober), Moulou, 2 ad. ♀; Karaba, 1 ad. ♀; Herer River, 1 ad. ♂, 1 ad. ♀; Hovisso River, 1 subad. ♂; Kassam River, 1 imm. ♂; Laga arba, 1 imm. ♂, 1 subad. ♀; Harawa, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Balassire, 1 imm. ♂, 1 ad. ♀; Sofia, 2 ad. ♀; Awara Malka, 1 subad. ♂; [Bissierino]? 1 ad. ♂.

Abyssinian Rift Valley: Lake Chala, 1 ad. ♂; Maraco, Dobbana, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀; Maraco, 1 imm. ♀; Maraco, Djido River, 1 ad. ♀; Hawash, Soddo, 1 ad. ♂; Lake Abassi, 1 ad. ♂; Lake Abaya, 1 ad. ♀; Gato River, near Gardula, 1 ad. ♂; Gardula, 2 ad. ♂, 2 ad. ♀, 1 juv. ♀.

One of the immature males from Wagar, British Somaliland, is a complete albino.

MEASUREMENTS: Length of bill, male, 21.5–25.5 (23.39); female, 21.0–25.0 (23.07). Wing, male, 122.0–136.0 (128.40); female, 120.0–132.0 (124.50). C.T.F., male, 89.0–104.0 (95.08); female, 89.0–101.0 (93.71). O.T.F., male, 99.0–118.0 (107.91); female, 101.0–113.0 (105.76). Depth of fork, male, 8.0–20.0 (12.87); female, 7.0–20.0 (11.74).

RANGE: The whole of the Ethiopian region north of the rain forest from Senegal to Somaliland. Intergrades with *adsimilis* in northern Uganda and Kenya, and southern Somaliland.

DISCUSSION: Van Someren in 1931 described and named as *D. adsimilis jubaensis* a series collected on the upper reaches of the Juba River. The characters given for this new race are that it is smaller and that its tail is "very much shorter" and "much less forked" than that of *divaricatus*, and that "the inner

webs of the wing feathers are pale, not black," and the gloss is "greenish-blue-black."

As far as the color of the inner webs of the primaries is concerned, it is never "black" in *divaricatus*. This character (dark or "black") is typical of *coracinus*, not of *adsimilis* and *divaricatus* in which the inner webs are always pale. The use of this character to separate the Juba birds from *divaricatus* is therefore erroneous, for while it does separate these specimens from *coracinus*, it cannot do so from *divaricatus*. In *divaricatus* the color of the gloss is also always "greenish-blue-black."

The character that is most emphasized in so-called *jubaensis* is the shallow fork of the tail. No actual measurements as to the depth of the fork are given, but a tracing of the photograph on plate 3, given in a subsequent paper by van Someren (1932), shows that in four Juba specimens (figs. 5–8, *loc. cit.*) the depth of the fork is about half of that of four specimens (figs. 1–4, *loc. cit.*) of the "coastal race." This "coastal race" is identified by van Someren as *divaricatus*, but, as already mentioned in the general discussion, I find that my coastal specimens from Tanga in northern Tanganyika to my most northern specimen at Kipini in Kenya are true *adsimilis*, not *divaricatus*. In this series, consisting of seven adult males, the depth of the fork measures 18.0–25.0 (22.07); in five adult males of *divaricatus* from British Somaliland the depth measures 9.5–13.0 (11.0). Therefore, the fact that the Juba birds have the fork only half as deep as the coastal birds does separate the Juba birds from *adsimilis* but not from *divaricatus*. This difference in depth (half) is exactly the difference that I find separates my long series of *adsimilis* from those of *divaricatus*.

In the original description the birds of the Juba River are said to be smaller than *divaricatus*; in the subsequent paper (1932, p. 301) this statement is changed to the tail's being "very much shorter (*vide* photograph, pl. 3, figs. 5–9)." The make up of skins differs, and photographs can be very misleading. In the photograph referred to, the Juba specimens do appear to have a shorter tail than the coastal birds. In the only specimens in which the shaft of the C.T.F. is clearly visible (figs. 2, 5, and 8) the length of these feathers is

found to be identical when measured on the photograph with a pair of dividers. The greater length of the tail would then seem to be due to the length of the O.T.F. This is given by van Someren as averaging 102.6 in the Juba birds; no individual measurements, range of variation, sex, or statement as to whether the birds are fully adult or not are given. In my series of coastal birds the O.T.F. measures in seven adult males, 103.0–113.0 (107.20), in five adult females 101.0–106.0 (104.0), in the 12 adults combined 101.0–113.0 (106.0). However, these coastal birds are not *divaricatus* but, as mentioned above, the slightly larger *adsimilis*. In a series of true *divaricatus* from a near-by region (British Somaliland), the O.T.F. measures in six adult males 100.0–109.0 (105.02), and in one adult female 103.0. A difference of only 2.5 mm. between van Someren's specimens and mine is certainly not significant and fails utterly to prove that the tail of the Juba birds is "very much shorter" than in *divaricatus*, or for that matter in *adsimilis*.

As regards wing length, the individual measurements are given and range in 13 Juba specimens (not separated as to sex or as to maturity or lack of it) from 110.0 to 120.0, with an average of 115.75. In my Somaliland series mentioned above, 12 adults and four subadults of both sexes measure for the wing 116.0–128.0 (121.50). Despite the lack of more satisfactory data, there exists, apparently, a small size difference in the length of the wing. This difference is not significant and appears to be the continuation of the west to east cline in the reduction of the length of the wing in *divaricatus*.

I regret to have taken so much space to discuss a form that I do not recognize, but since no material from the Juba region was available, I had to use the data as supplied by van Someren and felt that I should give detailed reasons why these data do not justify the recognition of *jubaensis* as sufficiently distinct from *divaricatus*.

***Dicrurus adsimilis coracinus* J. and Ed. Verreaux**

Dicrurus coracinus J. AND ED. VERREAUX, 1851, Rev. et Mag. Zool., p. 311. Gabon.

Dicrurus modestus ugandensis VAN SOMEREN, 1921, Bull. Brit. Ornith. Club, vol. 41, p. 102. Budongo [Uganda]. (Type in A.M.N.H.)

Differs from *adsimilis* and *divaricatus* in having the mantle, sides of the head, and underparts deep velvety blue black, and without gloss when seen from above, the gloss reappearing when the bird is seen from an angle. Primaries, above and below, dark, the light quill lining still discernible though obscured. White barring in the immatures lacking entirely, or reduced to occasional traces. The outer rectrices have a very slight tendency to curve outward a little more at the tips.

SPECIMENS EXAMINED: Southern Nigeria: Degema, 6 ad. ♂, 3 ad. ♀; Oguta, 1 ad. ♂, 2 ad. ♀; Anambra Creek, Agoleri, 1 ad. ♂; Anambra Creek, Ogrugru, 1 ad. ♂, 2 ad. ♀; Anambra Creek, 1 ad. ♂; Gregiani [Krikani]? 2 ad. ♂, 1 ad. ♀.

Fernando Po: 2 ad. ♂, 1 ad. ♀. Cameroon: Bipindi, 1 ad. ♂, 1 ad. ♀. Gabon: Ogowé River, Ngomo, 1 ad. ♂; Abanga River, 1 ad. ♂, 1 subad. ♂. Lower Congo: Zouangué, 1 unsexed ad.; Lutete, 1 unsexed ad.; Mayombe, Cabinda border, Lemba, 1 unsexed ad.

Belgian Congo: Lukolela, 1 ad. ♂, 1 imm. ♂, 1 juv. ♂; Kasai, Luluabourg, 4 ad. ♂, 1 subad. ♂, 3 ad. ♀, 1 unsexed ad.; Risasi near Stanley Falls, 1 imm. ♂; Aruwimi River, Panga, 1 ad. ♂; Ituri, Avakubi, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Uele, Rungu, 1 ad. ♂, 1 ad. ♀; Uele, Buta, 1 unsexed ad.; Beni, 1 ad. ♂, 2 ad. ♀; Angumu, 1 ad. ♀; forest east of Rutshuru Valley, 1 ad. ♂; Luvungi, 1 ad. ♂; forest "340 km. west of Baraka" [?, probably east of Kasongo], 1 ad. ♂, 1 imm. ♂.

Uganda: Budongo Forest, 1 ad. ♂, 1 subad. ♂ (the type of *D. modestus ugandensis*), 2 imm. ♂, 1 imm. ♀; Mpanga Forest, 1 imm. ♀; Lugalambo, 4 ad. ♂, 1 imm. ♂, 1 ad. ♀; Mubango, 1 subad. ♀; Kyetume, 1 ad. ♂; "near Kampala," 1 ad. ♀; Kasala, 1 ad. ♂, 1 imm. ♂; Sezibwa River, 1 ad. ♀; Mabira Forest, 1 imm. ♀; "Elgon," 1 ad. ♀.

Western Kenya: Yala River, 1 ad. ♂; Lerundo, near Kaimosi, 3 ad. ♂; Kakamega, 3 ad. ♂, 2 ad. ♀; 1 subad. ♀.

MEASUREMENTS: Length of bill, male, 22.0–27.0 (25.05); female, 22.0–26.0 (24.62). Wing, male, 122.0–138.0 (130.56); female, 121.0–132.0 (125.90). C.T.F., male, 86.0–100.0 (91.0); female, 82.5–94.0 (88.48). O.T.F., male, 104.0–122.0 (113.69); female, 102.0–119.0 (109.69). Depth of fork, male, 15.0–27.0 (22.32); female, 15.0–29.5 (21.26).

RANGE: The island of Fernando Po, and the

African rain forest from Lagos in southern Nigeria, through the forests of the Congo and Kasai, to the forests of Uganda, and Kakamega Forest in western Kenya.

DISCUSSION: Van Someren in 1921 described as *ugandensis*, type locality Budongo, the birds that inhabit Uganda from Toro to Elgon, on the basis of their being "more blue-black, less purplish black, than typical '*coracina*' from Gaboon and Nigeria."

I have examined a good series of 21 specimens from the region given as the range of *ugandensis*, and 10 others from near-by Kakamega. Included in the former were the type and five topotypes. The type is not fully adult and had probably not quite reached the full intensity of the plumage. Furthermore, when only our fully adult specimens from Uganda (Budongo, Lugalambo, Mabira) are compared with typical *coracinus* from Gabon and Nigeria, absolutely no difference is apparent, some Uganda birds being just as "purplish black" and some Gabon and Nigeria birds just as "blue-black." The slight difference shown by individuals in both regions is probably due to the state of the plumage.

Van Someren also found that "in size the races are practically alike, though on an average the Gaboon birds are larger." In our material the wing length of seven adult males of so-called *ugandensis* varies from 126.0 to 134.5 (129.96) and of 12 adult males from Gabon and Nigeria, from 122.0 to 132.0 (129.05).

I cannot, therefore, separate the birds of Uganda from those of Gabon and Nigeria, and I agree with Bannerman (1922) that *ugandensis* should be made synonymous with *coracinus*.

Dicrurus adsimilis atactus Oberholser

Dicrurus modestus atactus OBERHOLSER, 1899, Proc. U. S. Natl. Mus., vol. 22, p. 35. Fantee, west Africa [Gold Coast].

Back glossy but not so strongly so as in *adsimilis* and *divaricatus*. Gloss a little bluer. Primaries, above and below, somber, but never so dark as in *coracinus*. Immatures barred below a little more, as well as more often, than in *coracinus*. In fact, in every character *atactus* is intermediate between *ad-*

similis and *divaricatus* on the one hand and *coracinus* on the other.

SPECIMENS EXAMINED: Sierra Leone: Gandama, 1 ad. ♂; York Pass, 1 ad. ♂; Karine district, Rorosikur, 1 ad. ♀; Karine district, Gballandugri, 1 imm. ♀; Matru, 1 ad. ♀; Ma Yosso, north of Moyamba, 1 ad. ♀; Senahu, west of Moyamba, 1 ad. ♀. Liberia: Ganta, 1 imm. ♂, 1 ad. ♀.

Northern Angola: Lower Cuanza River, Barraca, 1 ad. ♂. Eastern Congo: lower Ruzizi River, 1 ad. ♂; Baraka, 1 ad. ♂; "1200 meters west of Baraka," 2 ad. ♂, 1 ad. ♀; Uele, Niangara, 1 ad. ♂.

MEASUREMENTS. Length of bill, male, 24.0–26.0 (24.50); female, 23.0–26.0 (24.50). Wing, male, 130.0–140.0 (134.29); female, 126.0–133.5 (129.58). C.T.F., male, 87.0–97.5 (93.0); female, 87.0–96.0 (93.10). O.T.F., male, 110.0–123.0 (115.91); female 108.0–113.5 (111.30). Depth of fork, male, 20.0–29.0 (24.33); female, 14.0–26.5 (18.20).

RANGE. Only well established in Upper Guinea in small patches of forest from Sierra Leone to Lagos, southern Nigeria, where it intergrades with *coracinus*; elsewhere continuing as a chain of isolated specimens around the rain forest in northern Angola, northwestern shore of Lake Tanganyika, Ruzizi Valley, Uele, and probably from there on to the west coast, along the northern border of the rain forest.

DISCUSSION. Hartlaub (1857) placed in the synonymy of *Dicrurus modestus* the name *Edolius ahantensis*. This name was not proposed by Hartlaub and was merely mentioned as being a manuscript name of Temminck. As *D. a. modestus* is restricted to Principe Island, I mention *ahantensis* here, even though it is a *nomen nudum*, in order to save possible confusion. Ahanta is the name of a coastal district of the Gold Coast just inland to the north of Cape Three Points, and as such comes within the range of *atactus*.

Dicrurus adsimilis modestus Hartlaub

Dicrurus modestus HARTLAUB, 1849, Rev. et Mag. Zool., p. 495. Principe Island. (Type in Hamburg Museum.)

More nearly resembles *coracinus*, but larger in every measurement, except the depth of the fork which is about the same but is not so widely spread. Mantle not so

dull and velvety and always with a small amount of dark blue gloss. Immatures barred below, some abundantly so, and with white feathers on the bend of the wing.

SPECIMENS EXAMINED: Principe Island: 14 ad. ♂, 1 subad. ♂, 2 imm. ♂, 11 ad. ♀, 4 imm. ♀, 5 unsexed ad., 1 unsexed imm.

MEASUREMENTS: Length of bill, male, 27.0–30.0 (28.27); female, 27.0–29.0 (27.82). Wing, male, 134.5–141.0 (138.61); female, 132.0–135.0 (133.68). C.T.F., male, 103.0–111.0 (107.0); female, 101.0–106.0 (104.79). O.T.F., male, 119.0–135.0 (126.40); female, 117.0–122.0 (120.18). Depth of fork, male, 16.0–24.0 (19.53); female, 12.0–21.0 (15.40).

RANGE: Restricted to Principe Island in the Gulf of Guinea.

DISCUSSION: The characters of this form constitute additional evidence that the non-glossy and the glossy forms are but races of one species. For, as noted by Bannerman (1939), *modestus* is also an intermediate. In general appearance it looks like a larger *coracinus* and has always been considered as conspecific with it, but its young are copiously barred as in the glossy forms, and its back, though dull, begins to show a certain amount of gloss approaching that of *atactus*. Thus the fact that *modestus* shows intermediate characters between *adsimilis* and *coracinus* should have suggested, even without the presence of *atactus*, their conspecific relationship.

Dicrurus fuscipennis Milne Edwards
and Oustalet

GREAT COMORO DRONGO

Buchanga atra var. *fuscipennis* MILNE EDWARDS AND OUSTALET, 1887, Ann. Sci. Nat. ser. 7, zool., vol. 2, p. 225. Grand Comoro Island.

Whole plumage deep lustrous black, glossed uniformly with dark dull blue, contrasting with the reddish brown primaries and rectrices. The gloss of the wing coverts gradually passing downward into bronze, the secondaries and sometimes the outer web of the rectrices gradually darkening inward. Lining of all the quills pale and silvery as in *D. a. adsimilis*. Tail shallowly forked and with the ends of the outer rectrices virtually straight.

SPECIMENS EXAMINED: Grand Comoro Island: 5 unsexed ad., 1 unsexed subad.

MEASUREMENTS (UNSEXED ADULTS): Length of bill, 31.5–34.0 (32.40). Wing, 142.0–153.5 (147.10). C.T.F., 111.0–118.0 (113.60). O.T.F., 125.0–136.0 (129.30). Depth of fork, 13.5–18.0 (15.50).

RANGE: Confined to Grand Comoro Island in the Comoro Archipelago.

DISCUSSION: As pointed out by Milne Edwards and Oustalet in their description of *fuscipennis*, this form is very closely related to *adsimilis*. They state, "Evidemment, la différence que nous signalons est peu importante et semble résulter seulement d'une action du climat qui, en empêchant le développement complet de la livrée de l'oiseau, a conservé à certaines parties du plumage les caractères du jeune âge; mais elle méritait d'être signalée puisqu'elle paraît constante chez les Drongos de la Grande Comore."

Dicrurus aldabranus Ridgway

ALDABRAS DRONGO

Buchanga aldabrana RIDGWAY, 1893, Proc. U. S. Natl. Mus., vol. 16, p. 597. Aldabra Island. (Type in U.S.N.M.)

Whole plumage deep lustrous black, glossed uniformly with dark dull blue. Wing linings pale. In this, the adult form, the appearance, texture, and gloss of the plumage are exactly similar to those of *D. a. adsimilis*. In the immatures, however, the birds are so very much paler that they are almost completely white below, and, above, are of a dingy gray brown instead of black.

Tail moderately forked, the ends of the outer rectrices curving slightly outward. The bill tends to be a little more hooked, and the frontal feathers are very definitely longer than in either *adsimilis* or *macrocerus*.

SPECIMENS EXAMINED: Aldabra Island: 1 ad. ♂ (the type of *D. aldabranus*), 2 ad. ♂, 2 imm. ♂, 1 imm. ♀ (the paratypes of *D. aldabranus*), 5 ad. ♂, 2 subad. ♂, 3 imm. ♂, 2 imm. ♀. Picard Island [= West Island]: 1 ad. ♂, 1 imm. ♂, 3 ad. ♀, 2 subad. ♀, 1 imm. ♀. Fous Island: 1 subad. ♂.

MEASUREMENTS: Length of bill, male, 28.5–30.0 (29.0); female, 27.5–30.0 (29.17). Wing, male, 128.0–141.0 (133.84); female, 131.0, 131.0, 131.0. C.T.F., male, 99.0–105.0 (102.72); female, 100.0–103.0 (101.66). O.T.F., male, 129.0–139.0 (133.45); female, 133.0–

134.5 (133.83). Depth of fork, male, 26.0–37.0 (30.72); female 31.0–34.5 (32.0).

RANGE: Confined to the Aldabra Islands, western Indian Ocean north of Madagascar.

DISCUSSION: The specimen indicated on the collector's label as coming from "Fous Island" is not quite adult and, although in very poor condition, appears to be *aldabranus*. It is in the Rothschild Collection, the label of the Tring Museum giving "Aldabra Island" as the locality, but this name has been crossed out and replaced by "Seychelles." I could not find "Fous Island" in either the Aldabras or Seychelles, but according to the United States Pilot for the southern Indian Ocean (1945, ed. 3) there is a "Fous Islet . . . southeastward . . . of Marianne Island" on the reef fronting Grand Port on the southeastern coast of Mauritius. It does not seem that the specimen could come from there as drongos never reached Mauritius or Reunion or the Seychelles.

The Aldabra Islands are very small, occupying an area of only 152 square kilometers. Moreover, according to Abbott (1893), they are very dry and, with the exception of areas of tangled brush, almost barren. Except for mangroves, large trees no longer exist. Under the circumstances the population, in addition to being very isolated, must also be very small.

It is therefore very interesting to see to what an extreme a character—in this case that of the immatures—can become intensified. Many immature forms of drongos show white or buffy barring on the plumage of the under surface of the body, as well as white tips on the axillaries and white edgings on the under wing coverts and under tail coverts. In *aldabranus* the axillaries and under wing coverts have become virtually all pure white, and the rest of the under plumage almost completely so, the white being dingier and soiled to an irregular amount with buffy or brownish gray. The white has also invaded the upper surface, the upper tail coverts being pure white, the wing coverts and even the secondaries are edged with white, and the rest of the upper plumage, instead of being black, is now a kind of sordid brownish gray, most of the feathers having buffy terminal edges.

Dicrurus aldabranus is also interesting in

another respect. The frontal feathers, instead of being short, inconspicuous, and closely applied to the bill as in *adsimilis* and *macrocerus*, are twice as long and curve forward and slightly upward. In this tendency towards becoming erect there is a hint of the crested drongos to come. I do not want to imply that *aldabranus* is necessarily intermediate between the *adsimilis* group and *forficatus*, but it certainly shows that *forficatus* was derived from *adsimilis*, and that these two are not very far removed.

***Dicrurus forficatus forficatus* Linnaeus**
MADAGASCAR DRONGO

Lanius forficatus LINNAEUS, 1766, Systema naturae, ed. 12, vol. 1, p. 134. Southeastern Madagascar. Based on *Muscicapa Madagascariensis nigra major cristata* of Brisson, 1760, Ornithologia, vol. 2, p. 388, pl. 37, fig. 4.

Muscicapa galatea BODDAERT, 1783, Table planches enluminées, vol. 1, p. 11, pl. 189. Madagascar. Based on "Grand Gobemouche noir huppé de Madagascar" of Buffon, 1783, Planches enluminées, vol. 1, pl. 189.

Dicrurus cristatus VIEILLLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 587, pl. D3, fig. 2. "Madagascar et au Cap de Bonne Espérance."

Dicrurus forficatus viridior SALOMONSEN, 1934, Proc. Zool. Soc. London, p. 223. Tabiky, western Madagascar. (Type in British Mus.)

Whole plumage deep lustrous black and uniformly glossed with steely dark greenish



FIG. 5. Head of *Dicrurus forficatus*.

blue. Immatures barred below to a varying degree with whitish or buff and with small white feathers along the inner bend of the wing. Frontal feathers elongated into a jaunty crest, erect or curving slightly forward (fig. 5). Tail moderately forked, with the ends of the outer retrices straight or almost so. If it were not for the presence of the crest, *adsimilis* and *forficatus* would be almost exactly similar. Their plumages are virtually identical, both in the adults and immatures, and their proportions and measurements are almost so.

SPECIMENS EXAMINED: Northern Madagascar: Anosirave, near Diego Suarez, 2 imm. ♂; Mt. des Français, 4 imm. ♀, 1 nestling ♂; Mt. d'Ambre, 1 imm. ♂; Andranofanjava, 1 ad. ♂; Tsarakibany, 1 ad. ♂; Nossi Bé, 1 imm. ♂; Maromandia, 1 ad. ♂; Bejofo, 1 subad. ♀; Sambava, 1 imm. ♂; Maroantsera or vicinity, 1 ad. ♂, 1 subad. ♂, 1 ad. ♀, 1 subad. ♀, 3 imm. ♀, 1 unsexed imm.

Eastern and southeastern Madagascar: Fano-vana, 1 ad. ♀; Didy, 1 imm. ♂; Vondrozo, 2 ad. ♂, 1 ad. ♀, 2 imm. ♀; Iampasika, 1 ad. ♂; Manombo, 2 ad. ♂, 2 ad. ♀; Ivohibé, 1 subad. ♂.

Western and southwestern Madagascar: Tsiromandidy, 2 imm. ♂, 1 ad. ♀; Tsiandro, 1 ad. ♀; no locality, "west central Mad.," 1 ad. ♂, 1 ad. ♀; Lake Iotry, 1 subad. ♀; Tabiky, 1 ad. ♂; Befandriana, 1 nestling ♀; Tulear, 1 unsexed ad.; Lake Tsimanampetsotsa, 1 ad. ♀, 1 imm. ♀; Ampotaka, 1 ad. ♀; "Antinsoy Cy., S. W. Mad." (not located), 1 ad. ♂, 1 subad. ♀, 1 imm. ♀.

Madagascar, no locality: 1 ad. ♂, 1 imm. ♂, 1 imm. ♀, 1 unsexed ad., 1 unsexed subad.

MEASUREMENTS: Length of bill, male, 23.0–28.0 (25.71); female, 24.0–27.5 (25.33). Wing, male, 124.5–135.5 (130.46); female, 123.0–126.0 (125.68). C.T.F., male, 90.5–97.0 (93.50); female, 87.5–97.0 (90.62). O.T.F., male, 123.0–140.0 (132.0); female, 120.0–136.0 (123.74). Crest, male, 23.5–40.0 (31.50); female, 20.0–34.0 (26.92). Depth of fork, male, 25.0–48.0 (37.40); female, 28.0–42.0 (32.44).

RANGE: Throughout Madagascar and Nossi Bé Island.

DISCUSSION: Salomonsen separated as *viridior* the birds of the dry western portions of Madagascar on the basis of being more greenish and of having paler wing linings. The new race was not recognized by Delacour and was also rejected by Rand. I have examined minutely the specimens brought

back by the Franco-Anglo-American Mission together with the additional specimens already in the collection of the American Museum. This material consists of 57 specimens, the same number examined by Salomonsen; it includes a topotype and matches exactly locality by locality. On the whole the western birds tend to be very slightly duller and paler than the eastern birds, though the difference is very subtle. The arid and open condition of the country in the west probably favors a more rapid wearing and discoloration of the plumage, for when freshly moulted or moulting specimens from both the east and west are compared, many are found to be identical. In view of the fact that the difference is not constant and may be due to more rapid wear, I believe that *viridior* is based on too slight a basis to be recognizable.

This form is the original *Drongo*, for, according to Milne Edwards and Grandidier (1879), this is the native name in use in the north among the Betsimisarakas, and Rand (1936) says that this name is also used by the Sakalavas. From the north of Madagascar the indigenous vernacular name "Drongo" has passed into universal use for all the members of the family.

Dicrurus forficatus potior Bangs and Penard

Edolius forficatus potior BANGS AND PENARD, 1922, Proc. New England Zool. Club, vol. 8, p. 25. Anjouan Island, Comoros.

Similar to neighboring *forficatus* but larger throughout, especially the bill which is considerably heavier and longer. Crest and coloration identical with those of *forficatus*.

SPECIMENS EXAMINED: Comoros Islands: Anjouan, 5 unsexed ad., 2 unsexed subad., 1 unsexed imm.

MEASUREMENTS (UNSEXED ADULTS): Length of bill, 30.0–31.0 (30.40). Wing, 140.0–144.0 (141.80). C.T.F., 102.0–108.0 (105.20). O.T.F., 143.0–153.0 (147.20). Crest, 28.0–35.0 (30.90). Depth of fork, 39.0–46.0 (42.0).

RANGE: Confined to Anjouan Island in the Comoro Archipelago.

Dicrurus waldenii Schlegel

MAYOTTE DRONGO

Dicrurus waldenii SCHLEGEL, 1866, Neder-

landsch Tijdschr. Dierk., vol. 3, p. 86. Mayotte Island.

Whole plumage deep lustrous black, glossed uniformly with dark dull greenish blue. Lining of the wings pale but slightly darker than in *D. a. adsimilis*, the plumage of the two being similar in texture and appearance. Bill similar in form to that of *adsimilis* and *macrocerus* but much heavier and much longer. Tail much more deeply forked and longer than in either of these two forms and with the ends of the outer rectrices curving strongly outward as in *macrocerus*.

SPECIMENS EXAMINED: Comoros Islands: Mayotte Island, 1 unsexed ad., 1 unsexed subad.

MEASUREMENTS (UNSEXED ADULTS): Length of bill, 34.0, 36.0. Wing, 145.0, 147.0. C.T.F., 116.0, 117.0. O.T.F., 175.0, 206.0. Depth of fork, 58.0, 90.0.

RANGE: Confined to Mayotte Island in the Comoro Archipelago.

DISCUSSION: The smaller of the two specimens is not quite fully adult, the wing appears to be, but not the tail, and to average the measurements would therefore be meaningless. The younger bird is also less glossy and shows slight but definite traces of white tips on the under tail coverts and on the small feathers along the inner bend of the wing.

DICRURUS MACROCERCUS

KING CROW

The range of *macrocerus* extends from southeastern Afghanistan and eastern Baluchistan¹ through the whole of India and Ceylon, Burma, Siam, Indochina, and the greater part of China where it reaches as far north as the Amur River. Southward, it breeds in the upper part of the Malay Peninsula as far as Mergui in Tenasserim and Koh Lak in southwestern Siam, and, skipping the rest of the peninsula and Sumatra, occurs again in Java and Bali. Off the Chinese coast it breeds also on Hainan and Formosa, and

¹ In Zarudny's tables of the distribution of the birds of Persia (1911, Jour. für Ornith., vol. 59, p. 221), this species is listed as breeding in the southern mountains of Persian Baluchistan, but apparently this is the only Persian record.

from the latter has recently been introduced successfully into the southern Marianas on Rota Island.

The more southern birds are non-migratory, but those that breed in northern China are highly so. To escape the severe winters, these fall back south, establishing their quarters all the way from southern China and Hainan through Indochina, Siam, Burma, and the upper part of the Malay Peninsula, the migration not quite reaching the Malay States. A curious fact about this migration, remarked upon by both La Touche (1926) and Deignan (1945), is that despite the very great numbers that in the autumn sweep down in the northeastern coast of China and arrive in northern Siam in October and November, no corresponding return movement has been noted in the spring.

The birds that breed in northern India, while not so truly migratory, are well known to wander extensively outside the breeding season and to be partial migrants as well. In the case of these latter, just how far south they go into peninsular India or Burma is at present unknown. The birds of northern Burma are migratory also and come down into southern Burma to spend the winter.

Despite the fact that these migrations and wanderings cause some confusion, seven races can still be recognized, three of them on a decrease in size from north to south in India. The largest of all (*albirictus*) is found in northern India and possibly in the extreme north of Burma, an intermediate race (*macrocerus*) occurs in peninsular and southern India, while the smallest (*minor*) is apparently restricted to Ceylon. Another small race (*javanus*), similar to these Indian races, is found in Java and Bali, but differs from them in proportions.

The birds of Burma (with the exception of Tenasserim), northern Siam, central and northern Indochina, Hainan, and China form the next race (*cathoecus*). This race is very close to the measurements of *macrocerus* but differs from it in having the lining of the wings dark instead of pale, the gloss greener, and the rictal spot much smaller and hidden.

In Tenasserim, central and southern Siam, and southern Annam occurs a resident and

non-migratory race (*thai*) which differs from *cathoecus* in having a shorter bill and wing and a longer and more deeply forked tail. *D. m. thai* has been difficult to distinguish because its territory is over-run by the winter migrants of *cathoecus*, and because it has the same proportions and about the same measurements as *javanus*, but differs from it in coloration.

The seventh and last race, *harterti*, occupies Formosa and is closest to *cathoecus* but is separable from it by a combination of long wing (equal to that of the longest in *albirictus*) and a tail definitely shorter than the wing. In all the other races, the length of the tail is at least equal to, or definitely longer than, that of the wing, *D. m. thai* and *javanus* in this respect standing at the other extreme from *harterti*. In my specimens the proportion of the length of the O.T.F. to that of the wing is, in round figures: *harterti* 97 per cent, *cathoecus* 100 per cent, *minor* 105 per cent, *macrocerus* 108 per cent, *albirictus* 112 per cent, *javanus* 119 per cent, *thai* (one specimen only) 124 per cent.

All the races of *macrocerus* have a white spot at the gape just behind the rictal bristles. In some races it is comparatively conspicuous, in others inconspicuous or hidden, and in the case of *javanus* has almost entirely disappeared but is still found as a very small hidden spot on an occasional specimen. The age of the bird does not seem to have any bearing on the presence of the spot, for it is present in immatures and subadults, and the specimens that lack the spot are equally divided between adults and non-adults. Usually, but by no means always, in the races having a

conspicuous spot, the spot is more prominent and larger in adults.

All authors mention this spot and make some use of it. Kloss (1921b) used it as a subspecific character in the description of a form. Baker (1918) cites its frequency in a long list of specimens from all parts of the range, and Riley (1938, p. 279) makes the astonishing statement that "In a rather large series of this form [*cathoecus*] examined from China, I have never seen in the adult a white rictal spot."

Since this spot is considered to be of some importance, and in view of the fact that my findings are not in accord with those of Baker and Riley, I am giving them here. The white rictal spot is present in: *albirictus*, 25 out of 25; *macrocerus*, 95 out of 97; *minor*, 4 out of 4; *cathoecus*, Siam, 22 out of 26, Indochina, 6 out of 6, Hainan, 15 out of 20, China, 26 out of 27; *thai*, 1 out of 3; *harterti*, 32 out of 38; *javanus*, 3 out of 21.

Probably the reason why I differ so much is that in the races having an inconspicuous spot it is very easy to overlook. Very often the spot is so small that it can be seen only by spreading the feathers at the base of the gape. Also, only comparable skins should be used, as the loss of just a few tiny feathers is enough to obliterate it.

If any two or three races are contrasted with one another, their differences are apparent, but if the seven races are considered as a group it becomes impossible to single out any measurement that does not intergrade at one point or another. In order, therefore, to give a clear understanding of the species at one glance I have tabulated them in the

TABLE 3
KEY TO THE RACES OF *Dicrurus macrocerus*

Race	Wing	O.T.F.	Fork	Wing Lining	Rictal Spot	Color of Gloss
<i>D. m. minor</i>	Short	Short	Shallow	Paler	Conspicuous	Blue
<i>D. m. macrocerus</i>	Medium	Medium	Medium	Paler	Conspicuous	Blue
<i>D. m. albirictus</i>	Long	Long	Deep	Paler	Very conspicuous	Blue
<i>D. m. harterti</i>	Long	Medium	Shallow	Darker	Hidden	Green
<i>D. m. cathoecus</i>	Medium	Medium	Shallow	Darker	Hidden	Green
<i>D. m. thai</i>	Short	Long	Deep	Paler	Hidden or lacking	Green
<i>D. m. javanus</i>	Short	Long	Deep	Paler	Lacking	Blue

simple key (table 3). The measurements fall pretty well within three categories. Wing: short (below 136 mm.), medium (136-146), long (146-159). O.T.F.: short (below 140), medium (140-157), long (157-185). Fork: shallow (below 47), medium (47-59), deep (59-76). The rictal spot is also used, the terms "very conspicuous" and "conspicuous" being only relative, for at its most conspicuous its largest measurement is only from 4 to 5 mm. When said to be "hidden" it is usually only visible by spreading the feathers and hardly reaches 2 mm. When present in *thai* and *javanus* it is minute but still perfectly visible.

The terms "blue" and "green" for the color of the gloss are also relative. They are valid only if applied to any one race as a whole, for in every series there are individuals which are bluer or greener than others. This variation is difficult to assess properly as it is associated with the wear of the plumage during life and also, probably, with the age of the skin.

It will be noticed in table 3 that *thai* and *javanus* are separated only by this difference in the color of the gloss. The two are very close, but can be separated, in addition to the color of the gloss, by small size differences impossible to express in the table.

GENERAL DESCRIPTION OF THE SPECIES

Whole plumage deep lustrous black, glossed uniformly with dull steel blue or greenish blue. Inner webs of the primaries and lining of the wings varying from paler to darker silvery brown. Frontal band and lores without gloss, velvety or dull black. A small white rictal spot at the angle of the gape is present to a varying degree in all the races. Immatures barred below in varying degree with whitish or buff and with small white feathers along the inner bend of the wing. Tail long and deeply forked, with the outer pair of rectrices curving outward and slightly upward at the tips.

With the exception of the rictal spot and a slightly greater amount of gloss, the plumage of both adults and immatures is exactly similar to that of *adsimilis* in appearance, texture, and distribution of gloss.

Dicrurus macrocercus albirictus Hodgson

Bhuchanga albirictus HODGSON, 1836, India Rev., vol. 1, no. 8, p. 326. Nepal.

Gloss more bluish than green. Inner webs of the primaries gray brown, darkening at the tips. Lining of the wings pale silvery brown. Rictal spot present in all specimens and comparatively large.

SPECIMENS EXAMINED: A. Afghanistan, northern Baluchistan, and northern India (north of the Ganges). Afghanistan: Mamakhel, 2 ad. ♂, 1 imm. ♂; Khudikhel, 1 ad. ♂. Northern Baluchistan: Rud i Bampur, 1 imm. ♂, 1 ad. ♀. Northern India: North West Province: Peshawar, 1 ad. ♂; Aligarh, 1 unsexed imm.; Bohdshawar, 1 ad. ♀; Kolung Labul, 1 imm. ♀. Kashmir: Cholmondeley, 2 unsexed ad. Northern Punjab: Kangra, Bhadwar, 1 ad. ♂; Burhogah (not located), 2 ad. ♂, 2 imm. ♀. Kumaon: Dehra Dun, 1 unsexed ad. Nepal: Thankot, 1 ad. ♂, 1 imm. ♂, 2 ad. ♀; Hetora, 1 imm. ♂. United Provinces: Lucknow, 1 ad. ♂; Gorakhpur, 1 imm. ♂, 1 imm. ♀; Kalnahi, 1 imm. ♂, 1 ad. ♀. Bihar: Darbhanga, Madhubani, 1 ad. ♂. Cooch Behar: Haldibani, 2 ad. ♂. Northern Bengal: Siliguri, 1 ad. ♂. Southern Bengal: Dacca, 1 imm. ♂. Cachar: Chuka Hills, Bagh o Bahar, 1 unsexed imm. Eastern Assam: Dibrugarh, 1 ad. ♂, 1 ad. ♀, 1 unsexed ad.

B. Northern and central India. Sind: Khinjar Lake, 1 ad. ♀; Sukkur, 1 unsexed imm. Radjputana: Sambhar, 1 ad. ♂. Gwalior: Chikli, 1 ad. ♂, 1 unsexed imm. United Provinces: Agra, 6 unsexed ad., 2 unsexed subad., 3 unsexed imm. Northern Central Provinces: Bheraghat, 1 ad. ♂, 1 ad. ♀, 1 subad. ♀, 1 imm. ♀.

C. Western Burma: Mt. Victoria, Kyundaw, 1 ad. ♂, 1 imm. ♂; Arakan (no locality), 1 ad. ♂, 1 imm. ♂.

REMARKS ON SPECIMENS EXAMINED: Only the specimens from paragraph A above are included in the measurements, as the specimens from these regions are true *albirictus*. Those from paragraph B are uncertain and may be intermediate between *albirictus* and *macrocercus*. Those from paragraph C are intergrades between *albirictus* and *cathoecus*. Stresemann and Heinrich (1940) also report finding such intergrades from the same locality, at Kyundaw, Mt. Victoria, western Burma.

MEASUREMENTS: Length of bill, male, 24.5-29.0 (26.27); female, 25.0-28.0 (26.40)

all adults, 24.5–29.0 (26.41); Wing, male, 146.0–159.0 (153.35); female, 148.0–150.0 (149.50); all adults, 146.0–159.0 (153.0). C.T.F., male, 96.5–115.0 (104.16); female, 98.0–111.0 (104.80); all adults, 96.5–115.0 (104.34). O.T.F., male, 157.5–185.0 (170.42); female, 150.0–176.0 (165.50); all adults, 157.5–185.0 (170.28). Depth of fork, male, 59.0–76.0 (66.27); female, 52.0–65.0 (59.0); all adults, 52.0–76.0 (66.12).

RANGE: Along the Himalayas from eastern Afghanistan to eastern Assam and from the foothills to the plain of the Ganges; south of the river down to about latitude 20° N. it intergrades with *macrocerus*. Intergrades with *cathoecus* in north Burma and in western Burma down into northern Arakan. The more northern birds wander or migrate south in winter to central India and possibly into central Burma.

DISCUSSION: Ticehurst (1933) studied closely the distribution of the King Crow in India and remarks that his results do not quite tally with the account given by Baker (1924). The main difference is that *macrocerus* does not seem to extend all the way up from the extreme south to northern Bengal and the foothills of the Himalayas.

Ticehurst lists the measurements of a very good series of populations, and as my conclusions agree with his the measurements of my specimens need not be broken down. The facts then seem to be: that the range of *albirictus* extends south to about the plain of the Ganges, that of *macrocerus* from latitude 20° N. southward, and that in between the two, in central India, there is a wide zone of intergradation between *albirictus* and *macrocerus*. In this zone, populations may be found that can be referred distinctly to one or the other race, such as the one from Calcutta mentioned by Ticehurst which was made up of 11 breeding birds which, even though smaller than others from the Himalayas, cannot be separated from *albirictus*.

A further complication is introduced in the intermediate zone by the factor, at present imperfectly known, of the wandering or partial migration of the more northern birds. During the winter some of these birds probably reach into this zone and may even go farther south. But Ticehurst does not think that they reach Hyderabad and the Madras

Presidency, for measurements of specimens from these regions, whether of summer or winter birds, show very little overlap.

Dicrurus macrocerus macrocerus Vieillot

Muscicapa atra HERMANN, 1804, *Observationes zoologicae*, p. 208 (not *Muscicapa atra* Gmelin, 1788, *Linnaeus Systema naturae*, ed. 13, vol. 1, p. 946). Tranquebaria, southern India.

Dicrurus macrocerus VIEILLLOT, 1817, *Nouveau dictionnaire d'histoire naturelle*, nouvelle édition, vol. 9, p. 588, based on "le Drongolon," Levaillant, 1805, *Oiseaux d'Afrique*, vol. 4, p. 72, pl. 174. Type locality restricted to Orissa by Baker, 1924, *The fauna of British India*, vol. 2, p. 356; here changed to Madras City.

Muscicapa biloba LICHTENSTEIN, 1823, *Verzeichniss der Doubletten Zoologischen Museums* . . . Berlin, p. 52, based on "le Drongolon" of Levaillant. "Ind. Orient."

Dicrurus indicus STEPHENS, 1826, in Shaw, *General zoology*, vol. 13, pt. 2, p. 139, based on "le Drongolon" of Levaillant. India.

Dicrurus longus BONAPARTE, 1850, *Conspectus generum avium*, vol. 1, p. 352, based on "le Drongolon" of Levaillant (*ex* Temminck MS). Java.

Dicrurus macrocerus peninsularis TICEHURST, 1932, *Bull. Brit. Ornith. Club*, vol. 53, p. 20. Madras City. (Type in British Mus.)

Similar to *albirictus* but smaller in every measurement.

SPECIMENS EXAMINED: Southern Central Provinces: Chanda, 1 imm. ♂, 1 ad. ♀. Madras Presidency: Bellary, 4 unsexed ad., 1 unsexed imm.; Cuddapah, 1 unsexed ad., 1 unsexed subad.; Sidhout, 1 ad. ♂, 1 ad. ♀; Vellore, 1 unsexed ad.; Madras, 1 unsexed ad.; Pondichéry, 4 unsexed ad., 1 unsexed subad.; Cuddalore, 7 unsexed ad., 1 unsexed subad., 6 unsexed imm.; Salem, 3 unsexed subad., 1 unsexed imm.; Kumbakonam, 7 unsexed ad.; Erode, 1 unsexed ad.; Coimbatore, 1 imm. ♂, 6 unsexed ad., 2 unsexed subad., 2 unsexed imm.; Tinnevely, 1 unsexed ad., 2 unsexed imm.; Nilgiri Hills, 2 unsexed ad.; Calicut, 5 unsexed ad., 1 unsexed subad., 3 unsexed imm.; Mangalore, 1 subad. ♀. Mysore: Mysore City, 1 unsexed ad., 1 unsexed imm.; Bangalore, 2 unsexed ad., 1 unsexed imm. Travancore: Trivandrum, 4 unsexed imm. Southern India, no locality, 10 unsexed ad., 4 unsexed subad., 2 unsexed imm.

MEASUREMENTS: Length of bill, male, 25.0; female, 25.0, 25.0; 52 unsexed adults, 24.0–27.0 (25.33). Wing, male, 144.0; female, 138.0, 140.0 (139.0); 53 unsexed adults, 134.0–149.0 (139.61). C.T.F., male, 97.5;

female, 93.0, 95.5 (94.25); 46 unsexed adults, 89.0–105.0 (97.38). O.T.F., male, 158.0; female, 146.0, 150.0 (149.0), 49 unsexed adults, 138.0–164.0 (151.0). Depth of fork, male, 60.5; female, 50.5, 57.0 (53.75); 40 unsexed adults, 45.0–63.0 (54.53).

RANGE: The whole of peninsular India, from latitude 20° N. southward.

DISCUSSION: The name of the common King Crow of Asia was formerly *Dicrurus ater* (*Muscicapa atra* Hermann, 1804). However, this name is preoccupied by *Muscicapa atra* of Gmelin (*loc. cit.*), and the next earliest name is that of Vieillot, *Dicrurus macrocercus*, which must therefore replace it.

Vieillot's failure to ascribe a locality for *macrocercus* has caused much confusion. As Kloss (1921b, p. 207) correctly states, the names *macrocercus*, *biloba*, *indicus*, and *longus* are all based on "le Drongolon," plate 174, of Levaillant, and the first satisfactory location of this bird is in India by Stephens in 1826.

Ticehurst (1933) claims that Java rather than India is the correct location for *macrocercus*, saying that since *biloba* is a synonym for *macrocercus* and *biloba* was referred to Java by Cabanis (1850), the type locality of *macrocercus* must also be Java. According to Ticehurst the birds of peninsular India are then left without a name, and he supplies *peninsularis* for them. However, as Kloss had remarked prior to Ticehurst, "Stephens' *Dicrurus indicus* 'India' is quite definite and must therefore be accepted as the typical locality for 'Le Drongolon' and, therefore, for the first Linnean name, *macrocercus*, applied to it which, by the subsequent description of the northern form as *albirictus* by Hodgson in 1836, becomes by elimination the name of the Peninsular Indian subspecies." Stephens' location of "le Drongolon" in India dates of 1826 and therefore antedates that of Cabanis in 1850 for Java.

The Javan race has also been referred to as *longus*. This name was taken from a manuscript name of Temminck by Bonaparte (*loc. cit.*) and given by him to the Javan bird that Horsfield (1822) had misidentified as being *Edolius forficatus*. Bonaparte (*loc. cit.*) says that *longus* is "Lev. Afr. t. 174." Since *longus* is also based on plate 174 of "le Drongolon," it must also be barred for further use. The

Javanese birds required a new name which Kloss supplied for them as *javanus*. The nomenclature is badly tangled, but the facts are clear and support Kloss and not Ticehurst, and I therefore follow Kloss.

As Ticehurst (1932) points out, the fixing of Orissa by Baker as the type locality of *macrocercus* is not very satisfactory. It may not be "erroneous," as Ticehurst says, but it is misleading. For, while the birds breeding in southern Orissa are probably true *macrocercus*, those breeding north of latitude 20° N. in Orissa fall into the intermediate zone between true *macrocercus* and *albirictus*. On the other hand, Ticehurst's choice of Madras City for *D. m. peninsularis* is unequivocal, and I adopt it here as the type locality of *D. m. macrocercus*.

Dicrurus macrocercus minor Blyth

Dicrurus minor BLYTH, 1854, Catalogue of the birds in the Museum of the Asiatic Society, preface and appendix 3 for no. 1219, p. 22. Ceylon.

Similar to *albirictus* and *macrocercus* but smaller than either.

SPECIMENS EXAMINED: Ceylon: Manaar, 1 ad. ♀; Aripo, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 26.0; female, 25.0. Wing, male, 131.0; female, 126.5, 136.5 (131.50). C.T.F., male, 90.0; female, 88.0, 95.0 (91.50). O.T.F., male, 137.0; female, 129.0, 140.0 (134.50). Depth of fork, male, 47.0; female, 41.0, 45.0 (43.0).

RANGE: Ceylon, resident low country dry zone. Straggler to low country wet zone and hill zone (Whistler).

DISCUSSION: Whistler (1944, p. 166) does not think this is a very good race and believes that "a more adequate series would probably show that it is not worth separating Ceylon and South Indian birds . . . Indeed the range in Ceylon, confined to the Jaffna Peninsula and the north-west coast as far south as Puttalam, suggests that its affinities are all with India and not Ceylon."

Baker (1924) also suggests that *minor* may be the breeding form of southern Travancore. In my specimens, four unsexed immatures collected at Trivandrum in southern Travancore in September measure for the wing: 130, 133, 138, 139 (135.0), and two have the O.T.F. 136.5, 149. One immature female from

Ceylon collected in May has a wing of 121 and an O.T.F. of only 115.

No one seems to have bothered to collect adequate series of this common bird, but my material, like that of everyone else, shows that the birds of Ceylon are indeed smaller. Until a large series of breeding birds can be compared with similar material from southern India, *minor* may be retained as a distinct race.

Dicrurus macrocercus cathoecus Swinhoe

Dicrurus cathoecus SWINHOE, 1871, Proc. Zool. Soc. London, p. 377. "China, Hainan, Formosa." Type locality restricted to South China by Hartert, 1921, Vögel der paläarktischen Fauna, vol. 3, p. 2017.

Dicrurus annectens siamensis KLOSS, 1918, Ibis, p. 226. Koh Lak, southwestern Siam. (Types in U.S.N.M.)

Nearest to *macrocercus* in measurements but with a slightly longer wing and bill and a slightly shorter tail. Gloss generally more dull green, less bluish. Wing linings darker. Rictal spot smaller and hidden.

SPECIMENS EXAMINED: Indo-Chinese countries. Siam: southwestern Siam, Koh Lak, 1 ad. ♂, 1 ad. ♀ (the types of *D. annectens siamensis*); south central Siam, Bangkok, 4 ad. ♂, 7 imm. ♂, 4 ad. ♀, 1 subad. ♀, 1 imm. ♀; Nakon Nayok, 1 imm. ♂; Paet Riu, 1 ad. ♂; northern Siam, Chiang Mai, 2 ad. ♂, 1 imm. ♂, 1 imm. ♀. Southern Burma: Kyeikpadein (near Pegu Town), 1 ad. ♂, 2 ad. ♀. Indochina: Cochinchina, no locality, 1 unsexed ad. Tonkin, Haiphong, 1 ad. ♂, 2 ad. ♀, 1 unsexed ad., 1 unsexed imm.

China: Western Yunnan, Tengyueh, 3 ad. ♂, 3 ad. ♀, 1 imm. ♀, 2 unsexed imm.; southern Yunnan, Mongtsz, 5 ad. ♂; Fukien, no locality, 1 ad. ♀; northern Kiangsi, Kiukiang, 1 ad. ♀; Anhwei, Anking, 1 imm. ♂; Shensi, Tsinling Range, Tai pai shan, 1 ad. ♂, 4 imm. ♂, 2 subad. ♀, 1 imm. ♀, 1 nestling ♀. Shantung, Chengchow, 1 ad. ♂, 1 ad. ♀; Tsinan, 1 ad. ♂.

Hainan: Hoihow, 1 ad. ♂, 2 imm. ♂, 1 ad. ♀, 3 imm. ♀; Kiungshan, 3 ad. ♂, 4 ad. ♀, 1 imm. ♀; Lei Mui Mon, 2 imm. ♂, 1 imm. ♀; No Tai, 1 imm. ♀; Utoshi, 1 imm. ♂; Nodoo, 1 ad. ♀, 1 subad. ♀; Hummocks, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 25.0–28.0 (26.35); female, 24.5–27.0 (25.86). Wing, male, 142.0–150.0 (146.0); female, 134.0–149.0 (143.37). C.T.F., male, 100.5–114.0 (106.25); female, 102.0–109.0 (105.20).

O.T.F., male, 140.0–154.0 (145.43); female, 136.0–150.0 (141.36). Depth of fork, male, 28.0–46.0 (39.32); female, 31.0–41.0 (36.23).

RANGE: From western and northwestern Burma where it intergrades into *albirictus*, through the rest of Burma (with the exception of Tenasserim), to northern Siam, Indochina north of southern Annam, Hainan Island, and the greater part of China where it reaches as far north and east as the Amur River (Swinhoe) on spring migration. In the fall the more northern birds migrate into southern China, Hainan, Indochina, Siam, and the Malay Peninsula short of the Malay States, the more northern birds of Burma migrating to the southern plains.

DISCUSSION: Although Baker includes the Kachin Hills of northern Burma as well as the Northern Shan States within the range of *albirictus*, the birds of these regions appear to be intermediate between the two races. According to Smythies (1940) this is true of northwestern Burma, and I have found it to be the case in western Burma, at least as far south as Mt. Victoria.

In November, 1916, Kloss obtained at Koh Lak in southwestern Siam two forms of the King Crow. One he identified as *Buchanga atra longus* [= *Dicrurus m. macrocercus*]. The other, not realizing, as he says (1921a, p. 53), "that one or both might be merely visitors and being unwilling to recognize two resident races of the same species occurring together, I forced . . . into *Dicrurus annectens* and described it with the name of *siamensis*. I have since realized that it is *Buchanga atra cathoeca* (previously recorded by Gyldenstolpe from Koh Lak, in Kungl. Svenska Vet. Akad. Handl., 56, no. 2, p. 20)." I have examined two of these specimens of Kloss, both marked types of *D. a. siamensis*, and they are indeed typical *cathoecus*.

Kloss collected further at Koh Lak, but this time during the breeding season, the additional material showing that the resident race was neither *D. m. macrocercus* nor *cathoecus* but a distinct form that he described as *Dicrurus macrocercus thai*.

Dicrurus macrocercus thai Kloss

Dicrurus macrocercus thai KLOSS, 1921, Jour.

Federated Malay States Mus., vol. 10, p. 208.
Koh Lak, southwestern Siam.

Differs from *cathoecus* by having a shorter wing and bill, which is also somewhat less robust, and by the tail which is longer and has a considerably deeper fork. In coloration, greenish, as in *cathoecus*, but with the wing lining paler. Rectal spot usually lacking or, if present, very small and hidden.

SPECIMENS EXAMINED: Southwestern Siam, Koh Lak, 1 imm. ♂; Tachin, 1 subad. ♀; central Siam, Wat Pa [=Lom Sak], 1 ad. ♂, 1 subad. ♀.

MEASUREMENTS: Length of bill, adult male, 23.5; immature male, 23.0; subadult female, 23.0; Tachin, subadult female, 22.5. Wing, adult male, 142.0; immature male, 130.0; subadult female, 132.0; Tachin, subadult female, 131.0. C.T.F., adult male, 104.0; immature male, 100.0; subadult female, 92.5; Tachin, subadult female, 95.0. O.T.F., adult male, 176.0; immature male, 143.5; Tachin, subadult female, 155.0. Depth of fork, adult male, 72.0; immature male, 43.5; Tachin, subadult female, 60.0.

Additional measurements as given by Robinson and Kloss (1924b) for the specimens collected at Koh Lak in April, (t = type of *D. m. thai*): Wing, male, 122, 135 (t); female, 122, 127, 130. C.T.F., male, 103, 105 (t); female, 100, 105, 107. O.T.F., male, 158, 177 (t); female, 154, 163. Depth of fork, male, 55, 72 (t); female, 51, 63.

RANGE: Tenasserim, southwestern and central Siam, and, according to Robinson and Kloss, southern Annam.

DISCUSSION: At Koh Lak in November, 1916, Kloss had collected specimens of *cathoecus* which were described as forming a new race of *D. annectans*. But also at Koh Lak, and at Tachin, Kloss had collected in October and November some specimens which did differ from *cathoecus* in having a shorter bill and a longer and more deeply forked tail.

Two of these, an immature male from Koh Lak and a subadult female from Tachin, are included among my specimens. The measurements of these specimens are given by Riley (1938) but were repeated above so they could be given in the same way as that of all my other specimens of *macrocerus*, and also because Riley failed to mention that these two specimens are not adults.

Again at Koh Lak, but this time in the first few days of April, 1919, Kloss collected more specimens of *macrocerus* that also had a short bill and wing and a long and deeply forked tail; these are the specimens on which *D. macrocerus thai* is based. As Robinson and Kloss state (1924b, p. 342), "The fact that *cathoecus* and the next subspecies *D. m. thai* occur together at Koh Lak is difficult to explain except on the theory that the latter is a resident while *cathoecus* migrates south to escape the Chinese winter."

In addition to the two specimens mentioned above, two others in the collection of the Academy of Natural Sciences of Philadelphia, taken at Wat Pa (=Lom Sak) in central Siam on October 5 and 10, have the short wing and bill and the long and deeply forked tail of *thai*.

The reason why it has been difficult to show the existence of a distinct resident race in southern Siam has been due, as Deignan remarks (personal communication), to the accidents of collecting, "The species [*macrocerus*] is common all the year [in central Siam], but very abundant in winter when the northern migrants arrive, and since most collecting in the tropics is done in winter [to escape the monsoon rains of the malarial summer months], by the law of averages a lot of *cathoecus* get shot . . . moreover, no one bothers with representative series of so common a bird and thus one fails to get representatives of the two forms."

My specimens bear witness to the truth of this statement. Of 31 specimens from Siam, 27 of which are from central or southern Siam, all were collected from October to the end of March, and all but four are apparently *cathoecus*.

A statement made by Smythies (1940, p. 146) is interesting. "Its status [*cathoecus*] however is uncertain; a few birds seem to be sedentary throughout its range and remain to breed but the majority appear to leave the southern parts of Burma (excepting Tenasserim) in the hot weather to breed in the plains of northern Burma, and return again in October." I believe that the explanation of why the birds of Tenasserim do not go north with the others is that they belong to the non-migratory southern race (*thai*) rather

than to the migratory and more northern one (*cathoecus*).

Although the specimens that I have seen of *thai* are too few and there are no indications in the literature, I believe that *cathoecus* and *thai* will eventually be found to intergrade into each other, probably in central Burma, western and north central Siam, and south central Annam.

Dicrurus macrocercus harterti Baker

Dicrurus ater harterti BAKER, 1918, Novitates Zool., vol. 25, p. 229. Tai-pek, Formosa. (Type in A.M.N.H.)

A large race, similar to *albirictus* in the long length of the wing and bill, but separable from it and all the other races of *macrocercus* by its curiously short tail; the only race in which the tail averages less than the wing. Wing linings darker, and coloration generally close to the greenish of *cathoecus*, though more specimens are bluer. Rictal spot very small and hidden.

SPECIMENS EXAMINED: Formosa: Tai-pek, 1 ad. ♂ (the type of *D. m. harterti*), 7 ad. ♂, 1 subad. ♂, 1 imm. ♂, 2 imm. ♀, 1 unsexed imm. (the paratypes of *D. m. harterti*); Pankio, near Tai-pek, 1 imm. ♀; Nan Wan Bay, 1 imm. ♂, 2 ad. ♀, 1 imm. ♀; Patchiuo, 1 ad. ♂, 1 unsexed imm.; Patsuna, 4 unsexed ad., 2 unsexed imm.; Takao, 1 unsexed ad.; Fungshan, near Takao, 1 ad. ♂; Sankocho, 2 ad. ♂; Bankoro, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀; Kaisanko, 1 ad. ♂; Sharaikisha, 2 ad. ♂; Sanchifunniuchi, 1 ad. ♂; Mt. Morrison, central Formosa, 1 ad. ♂; Chinchiku, northern Formosa, 1 ad. ♂, 1 imm. ♂; southwestern Formosa, no locality, 1 unsexed ad., 1 unsexed imm. Formosa, no locality, 1 ad. ♂, 1 ad. ♀, 2 unsexed ad.

Southern Marianas: Rota Island, Sosan Isthmus, 4 imm. ♂, 1 ad. ♀, 2 imm. ♀.

MEASUREMENTS: Length of bill, male, 25.0–29.0 (27.43); female, 26.5–28.0 (27.40). Wing, male, 145.0–158.5 (152.18); female, 145.5–152.0 (149.10). C.T.F., male, 104.0–115.0 (109.43); female, 106.0–113.0 (109.40). O.T.F., male, 140.0–157.0 (148.90); female, 137.0–157.0 (147.20). Depth of fork, male, 26.0–46.0 (41.05); female, 27.0–44.0 (35.80).

RANGE: Formosa, and Rota Island in the southern Marianas.

DISCUSSION: Through the courtesy of Lieut. Rollin H. Baker and United States

Naval Medical Research Unit No. 2, as well as Dr. H. Friedmann, I was able to examine seven specimens collected in October and November, 1945, in Rota Island in the southern Marianas. These specimens now form a part of the collection of the United States National Museum.

They are typical *harterti*, and I am informed by Lieutenant Baker that the bird is breeding successfully on Rota and also that Japanese records have been found indicating that it was introduced in its new home from Formosa in or about 1945.

The gloss of the adult female is greener than in most of the specimens of *harterti*, but still can be matched by about a quarter to a third of both adults and immatures of *harterti* as well as by most of the specimens of *cathoecus*.

Dicrurus macrocercus javanus Kloss

Dicrurus macrocercus javanus KLOSS, 1921, Jour. Federated Malay States Mus., vol. 10, p. 208. Badjoelmati, Besoeki, eastern Java.

Differs from *thai* principally by the color of the gloss which is bluish as in the Indian races, rather than greenish as in *thai*, *cathoecus*, and *harterti*. Probably similar to *thai* in the measurements of the bill and wing, but with a somewhat shorter and less deeply forked tail. Rictal spot almost always lacking.

SPECIMENS EXAMINED: Java: Mt. Gedeh, 1 subad. ♂, 1 imm. ♂; Batavia, 2 ad. ♂, 1 imm. ♂, 4 ad. ♀; Cheribon, 1 ad. ♂; Palaboehanratoe, 1 subad. ♂; Depok, 1 ad. ♂, 1 subad. ♀, 1 ♂ and 1 unsexed nestling; Tandjoeng (not located), 1 ad. ♂.

Bali: No locality, 1 ad. ♂, 1 imm. ♂, 1 subad. ♀; Boeileleng, 1 ad. ♀, 1 subad. ♀, 2 imm. ♀.

MEASUREMENTS: Length of bill, male, 23.0–26.0 (24.30); female, 24.0–25.0 (24.75). Wing, male, 130.0–138.0 (135.60); female, 132.0–133.0 (132.75). C.T.F., male, 92.0–100.0 (96.12); female, 97.5–100.0 (98.37). O.T.F., male, 156.0–164.0 (161.00); female, 148.0–161.0 (154.75). Depth of fork, male, 63.5–68.0 (64.87); female, 52.0–61.0 (57.87).

RANGE: Java and Bali.

DISCUSSION: Baker (1924, p. 359) gives for the range of this race, in addition to Java, "Malay Peninsula and extreme southwest and south Burma." It seems to me that this statement is probably due to a confusion of

the equally short-winged, short-billed, and long-tailed *thai* for *javanus*. This is very easy to do as there does not seem to be much difference in measurements between the two.

As far as the greatly insufficient number of available specimens show, the only difference in measurements between *thai* and *javanus* is in the length of the tail, that of the wing and bill being similar. The tail is a little longer in *thai*, five specimens of both sexes measuring for the O.T.F., 154.0–177.0 (165.60), as against 150.0–164.0 (158.63) in *javanus* for eight adults of both sexes. Four of the five *thai* measurements were taken from the literature (Robinson and Kloss, 1924b), and the measurements of my subadult specimens of *thai* make me suspect that some of the measurements of Robinson and Kloss are not those of fully adult birds. But, although no specimens of *javanus* with a tail of 176 and 177 appear to have ever been measured, the gap is certainly not very great.

Until more specimens of *thai* become available for measurements, the only reliable and significant difference will be in the coloration of the plumage, which in *thai* is greenish as in *cathoecus*, whereas in *javanus* it is frankly bluish as in the Indian races. To this, perhaps, may be added a slight difference in the shape of the bill, which in my lone adult specimen of *thai* is a little less robust than in any of my adult specimens of *javanus*.

Most of the specimens from Bali are not adult, but as far as they go, they do not seem to be different from those of Java.

DICRURUS LEUCOPHAEUS

ASHY DRONGO

Kloss considered the Ashy Drongos "among the most difficult of birds to discriminate," a view shared by Hartert. They are certainly the most difficult group of the family, because many of the forms are not clearly differentiated from one another, and within each form there is, besides, considerable variation as to measurements and color. To make it worse, most of the mainland forms are highly migratory and hence found, except during the breeding season, almost everywhere.

The Ashy Drongos have been generally split into three distinct species: *longicaudatus* for the dark forms of India and of southern Burma from Pegu down the Malay Peninsula

to Perak; *leucophaeus* for the paler forms of Assam, Yunnan, most of Burma, Siam, Indochina, Simalur, Java, Lombok, and Palawan; *leucogenis* for the forms with white facial marks of China, Hainan, Borneo, Sumatra, and the Mentawai Islands. As the breeding ranges of these three so-called species do not overlap anywhere, this distribution suggests that we may be dealing with races of one species.

As far as the forms with white facial marks are concerned, study shows that the extent of the white varies, that it recedes in some forms and all but disappears in others. As a result, Stresemann (1930) was the first to consider *leucogenis* conspecific with *leucophaeus*. Kloss (1931) came to the same conclusion, and this revision will show much additional evidence to confirm this view.

The problem of the relationship of *leucophaeus* and *longicaudatus* is harder to solve, but there again I believe that I have found evidence that the two are also conspecific. Their separateness was upheld by Kloss (1921a) and again with much emphasis by Ticehurst (1936). In these papers both Kloss and Ticehurst recognize a "Dark Ashy" species or *longicaudatus*, to which are referred the birds of India and those from Pegu to Perak; and a "Pale Ashy" species or *leucophaeus* for the birds of eastern Bengal, Assam, and those of Burma and Siam down to southern Annam.

However, at Darjeeling, where the dark and pale forms come together, I have found a breeding specimen that is a very good intermediate. I have also a series, from southwestern Siam and around the head of the Gulf, made up of 23 specimens, many of which cannot be reconciled to either the dark or pale forms. In this region the two supposedly distinct species also come in contact, and although my specimens were unfortunately not collected during the breeding season, they are too numerous and their evidence is too strong to be disregarded. All degrees of intermediacy are represented, and some of them at any rate show that the two forms intergrade. I believe, therefore, that until additional series made up of only breeding birds can be collected in the critical areas where the dark and pale forms come together, it is best to consider that there is but one species,

the dark and pale forms being only racially distinct.

If, as there is no doubt, *leucophaeus* and *leucogenis* are conspecific, and if my views are correct as to conspecificity of *leucophaeus* and *longicaudatus*, all the Ashy Drongos are left within only one species (by priority *leucophaeus*).

Even though some 500 specimens were examined, I am only too painfully aware of the serious gaps in the series. I was fortunate, however, in the case of every continental form but one (*nigrescens*) to have some adults collected during the breeding season. The number varied from a few to half or sometimes virtually the whole of the series, and all the comparisons were made with only such specimens.

The range of the species extends on the continent from eastern Afghanistan through India, the Indo-Chinese countries, the Malay Peninsula as far south as Perak, Hainan, and the greater part of China as far north as the interior of Manchuria. Most of the continental forms are highly migratory, the migration extending in one case as far south as Malacca. Off the continent the distribution coincides almost exactly with the continental shelf, the only exceptions being some of the western Sumatran islands and Lombok.

In all, 15 races can be recognized; their distribution is shown on figure 6, and their relative degree of darkness and size of the facial patch are as on figure 7.

GENERAL DESCRIPTION OF THE SPECIES

Above and below "Ashy," the gray color varying from deep slaty blue to pale French gray. Upperparts, in the darker races, glossed smoothly but not highly so, the amount of gloss becoming very slight as the races get paler, and lacking entirely in the palest races. Underparts duller, generally lighter, and without gloss except for a slight amount in the darkest races. Frontal band without gloss, varying from dull black to dusky. Some races have a white facial mark very variable in extent from race to race; the white may be limited to the lores or, extending to the region above and behind the eye, may cover the cheek and reach well beyond it.

Tail varying from long and slender, with deep fork, to moderate in length and depth of

fork. The outer rectrices flaring outward and upward, rather strongly so in the races having the longest tails.

Dicrurus leucophaeus beavani, new subspecies

TYPE: A.M.N.H. No. 387874. Adult male; Khudi Khel (south of Hashim Khel in the foothills or lower slopes of the Safed Koh), eastern Afghanistan; May 22, 1937; Walter Koelz, collector.

Deep glossy slaty blue, duller and slightly paler below. Frontal band and lores black, ear coverts dusky black. Tail long, slender, and deeply forked, the outer rectrices flaring rather strongly outward and upward.

SPECIMENS EXAMINED: A. Eastern Afghanistan and Himalayas or foothills (collected from April 15 to July 7): Afghanistan: Khudi Khel, 1 ad. ♂ (the type of *D. l. beavani*), 2 ad. ♂, 1 ad. ♀ (the paratypes of *D. l. beavani*); Daulat Shah, 1 imm. ♂. Kashmir, Vale of, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀. Northeastern Punjab: Chamba, Brahmaur, 2 imm. ♀; Kangra, Bhadwar, 1 ad. ♂; Kulu, Nagar, 2 ad. ♂; Manali, 1 ad. ♂; Kakinal, 1 ad. ♀. Northwestern United Provinces: Kumaon: Bhim Tal, 1 ad. ♂, 1 ad. ♀, both "shot off the nest"; Almora, 1 imm. ♂; Landour, 1 unsexed ad. Northeastern United Provinces: Nichlaul, 1 ad. ♂, 1 imm. ♀. Nepal: Thankot, 9 ad. ♂, 1 ad. ♀, 1 imm. ♀.

B. Himalayas (undated or collected from September 29 to March 26): Kashmir, Islamabad (Anantnag), 1 imm. ♂. Northwestern Punjab, Murree, 1 ad. ♀. Northeastern Punjab, Kulu Valley, 2 unsexed ad.; Simla, 1 unsexed imm.

C. South of the Himalayas (possible migrants, November 2 to March 5): Southern United Provinces, Etawah, 1 unsexed ad. Southern Bengal, Ganges delta, Sevoke, 1 ad. ♂. Northern Madras Presidency, Mahendra, 1 ad. ♂, 3 imm. ♂. Southern Bombay Presidency, Londa, 3 ad. ♂, 4 imm. ♂, 2 ad. ♀, 1 imm. ♀; Castle Rock, 1 imm. ♂; Jagalbed, 2 ad. ♂, 1 ad. ♀, 1 imm. ♀.

MEASUREMENTS OF THE TYPE: Adult male, bill, 28.0. Wing, 143.0. C.T.F., 91.0. O.T.F., 166. Fork, 75.0.

MEASUREMENTS (SPECIMENS IN PARAGRAPHS A AND B ONLY): Length of bill, male, 25.5–28.0 (26.90); female, 26.0–27.0 (26.40). Wing, male, 137.0–147.0 (141.17); female, 135.0–143.0 (139.0). C.T.F., male, 86.0–97.0 (90.24); female, 86.5–96.0 (91.65). O.T.F., male, 156.0–170.0 (162.0); female, 147.0–165.0 (154.57). Depth of fork, male, 63.0–84.0 (71.0); female, 57.0–73.0 (63.0).

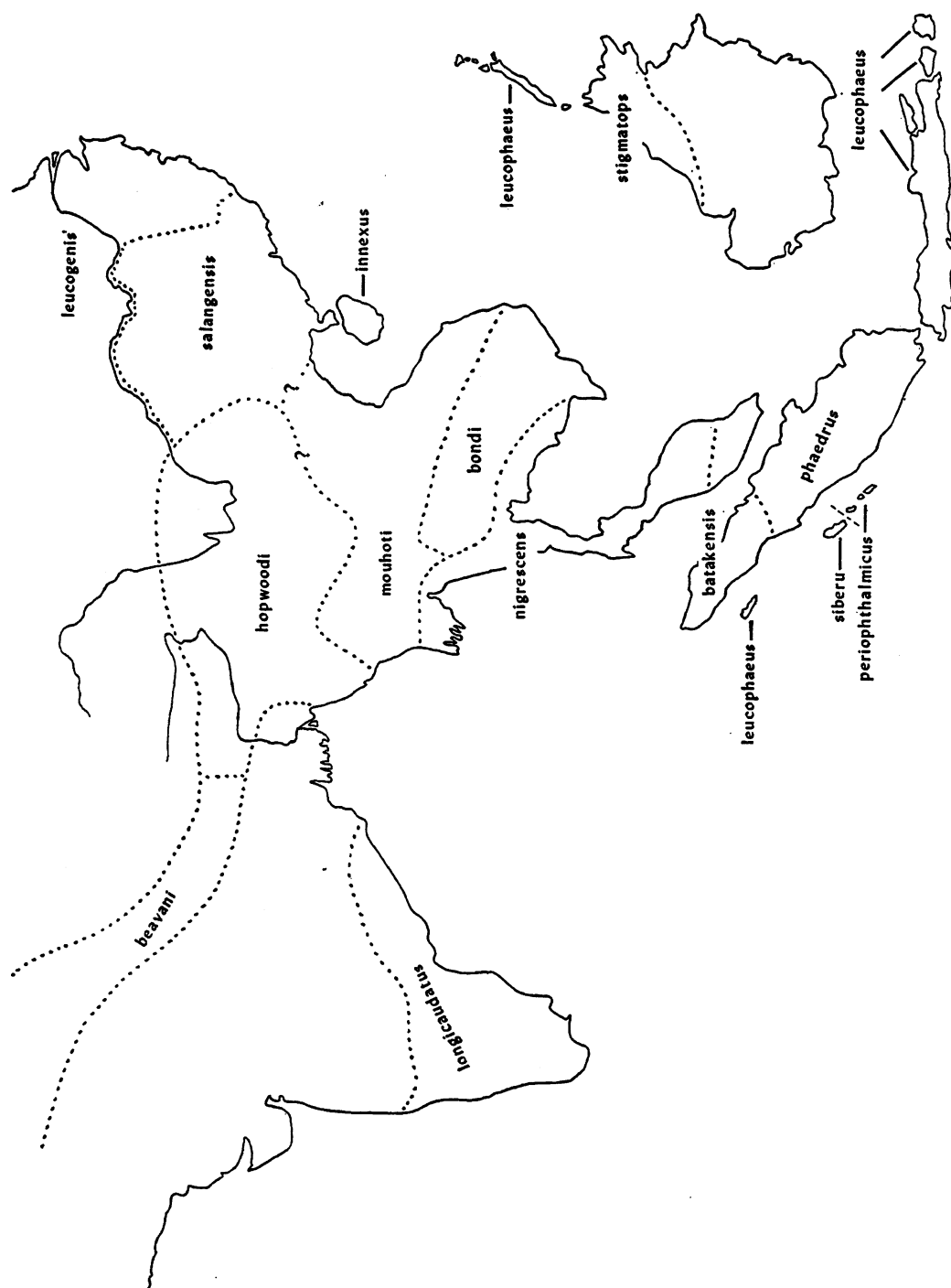


FIG. 6. Distribution of *Dicrurus leucophaeus*.

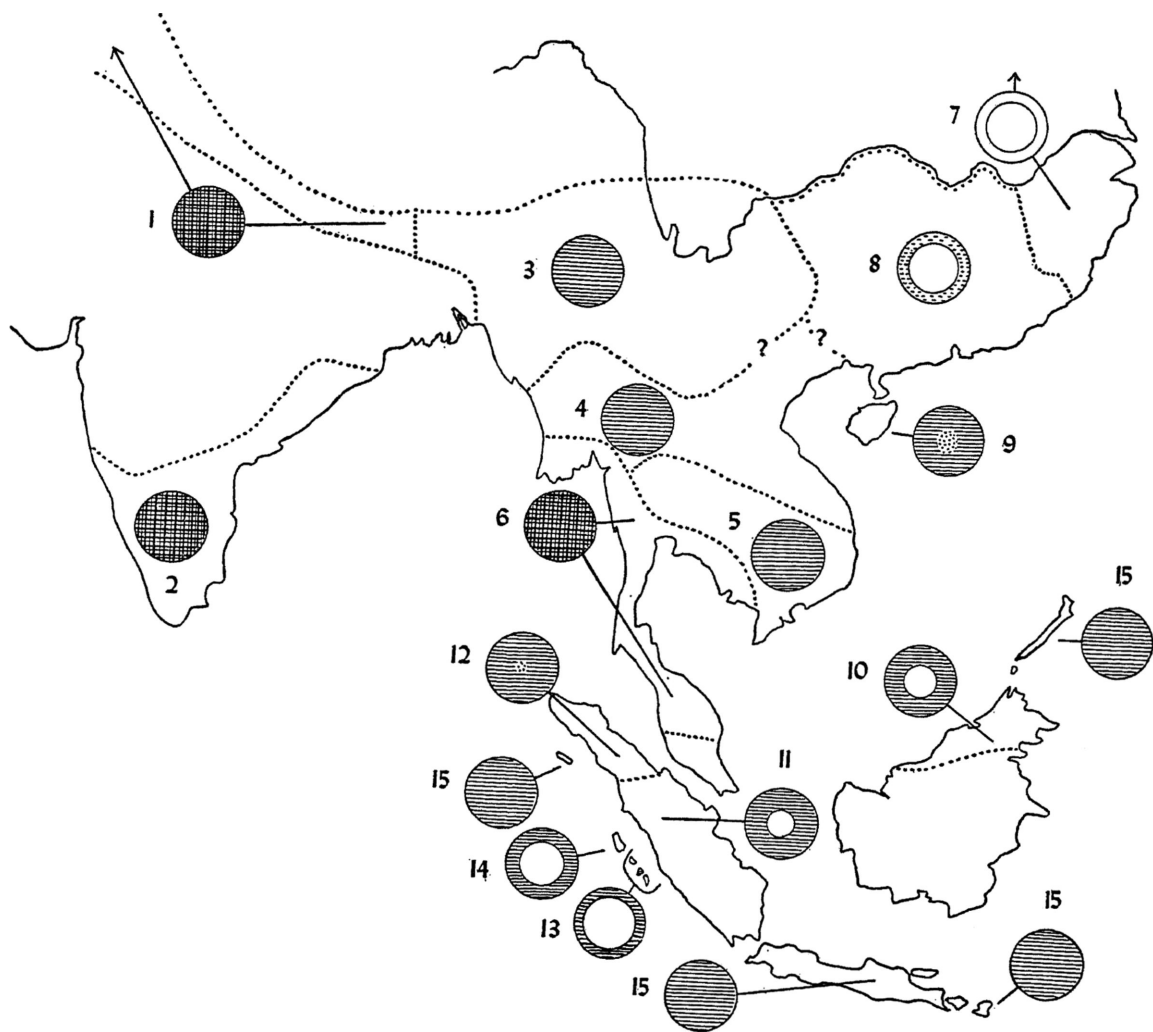


FIG. 7. Relative degree of darkness (full or outer circle), and relative size of the white facial mark (inner circle) in the races of *Dicrurus leucophaeus*. 1. *D. l. beavani*. 2. *D. l. longicaudatus*. 3. *D. l. hopwoodi*. 4. *D. l. mouhoti*. 5. *D. l. bondi*. 6. *D. l. nigrescens*. 7. *D. l. leucogenis*. 8. *D. l. salangensis*. 9. *D. l. innexus*. 10. *D. l. stigmatops*. 11. *D. l. phaedrus*. 12. *D. l. batakensis*. 13. *D. l. periophthalmicus*. 14. *D. l. siberu*. 15. *D. l. leucophaeus*.

RANGE: The lower slopes and foothills of the mountains of eastern Afghanistan and of the Himalayas as far east as Darjeeling where it intergrades with *hopwoodi*. Migrates to winter in peninsular India.

DISCUSSION: Walden, who had made an extensive study of the drongos with a view to publishing a monograph on this family (said monograph apparently never reached publication), was of the opinion (1866) that the birds of the Himalayas were distinct from those of the rest of peninsular India and that

accordingly they should be described and named. This was done two years later by Beavan (1868) from birds collected on June 2 at Simla. In acknowledgment of Walden's suggestion he called the new form *Buchanga waldeni*.

Bhuchanga, however, has since been merged under *Dicrurus*, and *B. waldeni* Beavan (1868) will need a new name as it is preoccupied by *Dicrurus waldenii* Schlegel (1866) for the Mayotte Drongo. As *B. waldeni* Beavan never received an adequate descrip-

tion and the present whereabouts of the type is uncertain, I thought it would be preferable to fix a definite type and to redescribe the populations of eastern Afghanistan and the lower Himalayas as a new form, which I have done as *Dicrurus leucophaeus beavani*.

Question has been applied as to the validity of a Himalayan race as distinct from one from the rest of India. Ticehurst (1936, p. 276) recognized but one form (*longicaudatus*) for the whole of India, for, as he states, "though described from the Nilghiris, the Dark Ashy Drongo has not been proved to breed in India proper outside of the Himalayas."

However, there is some evidence that the bird does breed south of the Himalayas. Whistler and Kinnear (1933), reporting on the Vernay Scientific Survey of the Eastern Ghats, list specimens collected on April 17, 1929, near Salem, and on April 18, 1930, at Jeypore Agency in the Vizagapatam Hills in northern Madras, the latter with enlarged gonads. Jerdon (1862, p. 431) states that it is a "permanent resident in the South of India . . . I found its nest on one occasion, in April, in Lower Malabar." In the collection of the American Museum is an immature unsexed specimen, A.M.N.H.No. 61855, collected in August in Calicut. This bird is in juvenal plumage with a short immature bill and undoubtedly had bred locally.

More evidence would be desirable, but if the bird does breed in southern India, and in some parts of peninsular India, and apparently it does, the only question is whether it is really separable from the bird breeding in eastern Afghanistan and the Himalayas. I believe it is, and that the more northern *beavani* should be separated from the more southern and peninsular *longicaudatus*.

The difference is mainly one of size, the birds from the Himalayas being a little larger. My material from southern India, with the exception of the immature from Calicut, was all collected from October to February 19, and therefore proves nothing as to breeding; besides, the skins are mostly poor and mostly unsexed, so that I do not put too much reli-

ance on them. Nevertheless, taking only those specimens that are unquestionably adults, they measure for both sexes, for the wing: 128, 130, 130.5, 132, 133, 133, 133.5, 134.5, 142, 143, 145, 146 (135.88); for the O.T.F.: 139, 141, 141, 143.5, 147, 147, 151, 157.5, 158, 159, 162, 165, 166 (152.07). Breeding birds in Himalayas, for the wing: male, 137, 138, 138, 138, 139, 140, 140, 141, 141, 142, 142, 142, 142, 143, 143, 143, 145, 147 (141.17); female, 135, 136, 139, 140, 141, 143 (139.0); for the O.T.F.: male, 156, 158, 159, 159, 160, 160, 161, 161, 162, 162, 162, 164, 164, 166, 168, 170 (162.0); female, 147, 148, 149, 154, 157, 162, 165 (154.57).

There is some overlapping of measurements, but in my series from southern India it is possible and probably likely that the larger specimens are migrants from the north. It does seem to be a fact that the southern birds are smaller, and I believe Baker (1918, p. 295) is undoubtedly correct when he says that his specimens show that "in size they decrease steadily as they get farther and farther south."

Besides the difference in size there is also a very slight difference in color. It is difficult to assess, and Ticehurst (1936) says that it does not exist. I agree with Baker (1918, p. 295) that it does seem to exist but that "it is not easy to distinguish." The southern birds are somewhat lighter above and have a warm, very deep blue gray cast rather than the dark slaty blue of the birds from the Himalayas; they are also paler and grayer below. The difference is not great but seems definite and constant and is better seen than expressed.

I have not included in the measurements the birds from paragraph C in my list of specimens, nor have I used them for comparison as they were all collected in peninsular India during the winter. They appear to be migrants from the north. In color and measurements they match perfectly the dark breeding birds from eastern Afghanistan and the lower Himalayas.

The similarity in measurements is shown below:

PARAGRAPHS	N	WING	N	O.T.F.
A and B	19 ♂	137-147 (141.17)	17 ♂	156-170 (162.00)
C	7 ♂	139-150 (142.64)	7 ♂	155-174 (162.57)
A and B	7 ♀	135-143 (139.00)	7 ♀	147-165 (154.57)
C	3 ♀	139-141 (139.50)	3 ♀	149-162 (153.67)

***Dicrurus leucophaeus longicaudatus* Jerdon**

Dicrurus longicaudatus JERDON, 1862, Birds of India, vol. 1, p. 430. Segour Pass, Nilgiris.

Dicrurus leucophaeus minimus BAKER, 1918, Novitates Zool., vol. 25, p. 296. Trincomali, Ceylon. (Type in A.M.N.H.)

Similar to *beavani* but with a shorter wing and tail. Somewhat lighter in color and more of a warm, very deep blue gray cast than dark slaty blue.

SPECIMENS EXAMINED: Southern India: central Madras Presidency: Bellary, 5 unsexed ad., 4 unsexed imm. Southern Madras Presidency: Cuddalore, 1 unsexed ad., 1 unsexed imm.; Nilgiri Hills, Coonoor, 1 ad. ♂, 1 ad. ♀; Calicut, 1 unsexed ad., 1 unsexed imm.; Coimbatore, 1 imm. ♀; Tinnevely, 2 unsexed ad. Mysore, Bangalore, 1 imm. ♂, 1 unsexed ad. Travancore, 1 ad. ♂. With the exception of the unsexed immature in juvenal plumage collected in August in Calicut, all the others were taken from October 6 through March 9.

Ceylon: Trincomali (December 22), 1 imm. ♂ (the type of *D. l. minimus*); no date or locality, 1 imm. ♀, 1 unsexed subad.

MEASUREMENTS: As only three adult specimens are sexed, the measurements of all adult specimens are given together. Length of bill, 26.0–28.5 (27.18). Wing, 128.0–146.0 (135.88) C.T.F., 84.0–95.0 (89.75). O.T.F., 141.0–166.0 (152.07). Depth of fork, 42.5–73.0 (62.37).

RANGE: India, south of the Himalayas in southern India and parts of peninsular India. Occurs in Ceylon as a winter visitor.

DISCUSSION: The first appearance of the name *longicaudatus* (Jerdon, 1845, Madras Jour. Lit. and Sci., vol. 13, pt. 2, p. 121) is as a *nomen nudum*, Jerdon merely stating that Hay had given it this name and would describe it later on. But Hay never did, and the name reappears for the second time in 1862 in Jerdon's "Birds of India," this time with a full description.

Stuart Baker (1918, p. 296) separated the birds of Ceylon as *minimus* on the basis of their smaller size, remarking also that "it appears to be also rather a darker bird than those from Southern India, but the difference is so slight as to be negligible." The measurements he gives for 13 specimens not separated as to sex are: wing, 126.0–135.0 (131.6); tail, 133.0–147.0 (139.0). These measurements are smaller, especially so for

the tail, than those of our specimens from southern India. However, immature and subadult birds are probably included, since the type itself is an immature. In measurements and color the type is identical with other immature specimens from southern India, and since it was collected on December 22 was probably a winter visitor to Ceylon.

Dicrurus leucophaeus does not appear to breed in Ceylon where, apparently, it occurs only as a winter visitor. Legge (1879, p. 390) states: "This species arrives in the north of Ceylon about the middle or latter part of October. It is decidedly migratory, as no individuals are seen between April and September, and at the season of its appearance it is always first met with on the seashore."

Baker had trouble fixing the breeding range of *minimus*, and he agreed (1924, p. 364) that the bird did not breed in Ceylon, but although its nidification was not recorded "... there is a very small dark Drongo which does breed in the extreme South of Travancore, smaller, and darker than specimens from N. Travancore and Malabar. This bird is exactly the same as the Ceylon one and has the same short tail." Whistler (1944, p. 166) believes, however, that since he has "seen no evidence that this Drongo is anything but a winter visitor to Travancore," *minimus* appears to be based on the first winter birds of *longicaudatus*.

Whistler is probably correct. However, my two other specimens collected in Ceylon (immature female and unsexed subadult, no date or locality) have the tail considerably shorter than any of my corresponding immature specimens from southern India. In the two Ceylon birds the O.T.F. measures 115 and 116, whereas in seven immature specimens of both sexes from southern India it measures 123.0 to 144.0 (131.0). The two Ceylon birds are also distinctly darker, particularly below.

The evidence is slight and until nesting records are available and a good series of breeding birds can be compared, it is best to keep *minimus* as a synonym of *longicaudatus*, but if a small dark race with a short tail should be found breeding in extreme southern India, the name *minimus* can be used for it.

***Dicrurus leucophaeus hopwoodi* Baker**

Dicrurus leucophaeus hopwoodi BAKER, 1918, Novitates Zool., vol. 25, p. 294. Dacca, south-eastern Bengal.

Dicrurus leucophaeus stevensi BAKER, 1918, Novitates Zool., vol. 25, p. 295. Darjeeling. (Type in A.M.N.H.)

Dark ashy gray above, with dull bluish luster; below, dull ashy gray, paler and lighter. Frontal band and lores dusky black, ear coverts dark gray. There is much variation in color and size, but the wing averages longer, and the tail shorter with a shallower fork than in *beavani* and *longicaudatus*, and the bird is always considerably lighter both above and below.

SPECIMENS EXAMINED: (In the following list all the birds collected during the breeding season are indicated, as well as those that appear to be migrants from farther north.)

Eastern India: Southeastern Bengal, Dacca, 1 imm. ♂; northern Bengal, Darjeeling, Rungarum (April 25), 1 ad. ♀ (the type of *D. l. stevensi*); Darjeeling district, Badamtam Forest, Rangit, 1 imm. ♂. Sikkim: Namtchi, 1 unsexed ad.; Sikkim, 1 unsexed imm. Assam: western Assam, Goalpara, 1 ad. ♀; Rangakona, 1 ad. ♀. Eastern Assam: Dibrugarh, 3 ad. ♂; Margherita, 1 ad. ♂, 3 ad. ♀. Northern Cachar (all specimens from April 21 through May): Guiland, 2 ad. ♂, 2 ad. ♀, 1 subad. ♀; Luisung, 1 subad. ♀; Gunjong, 1 subad. ♂, 1 ad. ♀, 1 unsexed nestling.

Burma: Northern Burma: Gangfang, 1 imm. ♂; Langyang, 1 ad. ♂; Lauhkaung (60 miles northeast of Myitkyina), 1 ad. ♂. Upper Chindwin, Dalu (=Taro), 1 ad. ♀. Lower Chindwin, Kani, 1 ad. ♂. Eastern Southern Shan States, Kengtung, Loimwe, 3 ad. ♂, 1 subad. ♂, 1 subad. ♀, 1 unsexed imm. Lower Burma, Thandaung, 1 ad. ♀, 1 unsexed ad.; Rangoon, 2 unsexed ad., 1 unsexed imm.

Siam: Northern Siam: Chiang Sen, 1 ad. ♂; Doi Suthep, 3 ad. ♂; Doi Pha Hom Pok, 2 ad. ♀ (all specimens collected from December 9 to February 21). Eastern Siam, near the Mekong, Ban Chanuman, 2 ad. ♂, 2 ad. ♀, 1 subad. ♀, 1 imm. ♀; Ban Khulu, 1 ad. ♂ (December 24 to February 8). All specimens from Siam appear to be winter visitors.

China: Northern Yunnan: Likiang Range, 4 ad. ♂, 1 subad. ♂, 1 imm. ♂, 1 subad. ♀, 1 unsexed juv. "out of nest" (the subad. ♀ and the imm. ♂ collected in May and June, the juvenal in September); Yangpi, 1 ad. ♂. Northwestern Yunnan: Salween River, Changhung, 1 ad. ♂; Yungchang, 1 ad. ♂, 1 imm. ♂; Tengyueh (April through July), 2 ad. ♂, 1 ad. ♂?, 2 ad. ♀, 1 imm. ♀, 1 unsexed ad., 1 unsexed imm.; Shweli Valley, 3 ad. ♂, 1 imm. ♂, 1 imm. ♀. Southern Yunnan: Mengtze (May 12 through June 30), 2 ad. ♂, 2 imm. ♂. Western Szechwan, Baurong (May 2),

1 ad. ♂. Southwestern Kweichow, Hwangtsaopa, 2 ad. ♂, 2 ad. ♀.

Indochina: Northwestern Tonkin: Cha Pa, near Laokay, 1 ad. ♀; Lai Chau, 1 ad. ♂; Ballam Nhung, 1 ad. ♂; Muong Moun, south of Lai Chau, 1 ad. ♂, 1 ad. ♀. Eastern Tonkin: Ile de la Table, off Haiphong, 1 ad. ♂. Northern Laos, Phong Saly (April 25), 2 ad. ♀ "breeding"; "50 Km, east northeast of Phong Saly," (May 28), 1 ad. ♂; Boun Tai, southwest of Phong Saly (May 25), 1 ad. ♀. Northern Annam: Lang Lanh, 1 ad. ♂; Hoi Xuan, 1 ad. ♀. Southern Laos: Paksong, 1 ad. ♂; Thateng, 1 ad. ♂, 1 subad. ♀; Paksé, 1 ad. ♀.

Hainan: Lei Mui Mon, 2 imm. ♂, 1 imm. ♀; Hoi How, 1 subad. ♂, 1 imm. ♀; Liudon, 1 ad. ♂; southern Hainan, 2 ad. ♂; Riudon, 1 imm. ♂, 2 ad. ♀; Wupa Shi, 1 subad. ♂; Uto Shi, 1 imm. ♀. All these Hainan specimens are probable winter visitors; they were collected from November 20 through March 20, and one on April 6.

MEASUREMENTS: Length of bill, male, 26.0–30.0 (28.44); female, 26.5–30.5 (28.02). Wing, male, 135.0–153.0 (145.28); female, 137.0–153.0 (141.88). C.T.F., male, 94.0–108.0 (101.10); female, 92.0–105.0 (99.97). O.T.F., male, 138.0–170.0 (154.50); female, 137.5–164.0 (149.96). Depth of fork, male, 39.0–63.0 (53.20); female, 39.0–62.0 (50.41).

RANGE: The eastern Himalayas from Darjeeling district (where it intergrades with *beavani*), eastward through Assam north and south of the Brahmaputra, northern Cachar, northern Burma, the whole of Yunnan to southwestern Szechwan, western Kweichow, and parts of Kwangsi and Kwangtung (La Touche). Southward, to the Chittagong Hill Tracts (Baker), through the Chindwin to the Chin Hills as far as Mt. Victoria (where it intergrades with *mouhoti*), eastern Northern Shan States, Tonkin, northern Laos, and northern Annam. Intergrades with *mouhoti* in northwestern and western Laos, and north central Annam. Migrates south to winter in southern Burma, northern Siam, eastern Siam, southern Laos, and Hainan Island.

DISCUSSION: Baker (1918) gave the name *stevensi* to the birds found in west central Nepal, Sikkim, Bhutan, and the hills north and west of the Brahmaputra as far as eastern Assam. The type, which is in the collection of the American Museum, is an adult female and probably a breeding bird as it was collected on April 25, 1900, at 5700 feet altitude at Darjeeling. I have also an immature male

from the same locality collected on December 24; it is a bird of the year and may have been bred locally. This latter appears typical of the general color of *hopwoodi*; the type on the other hand is a very good intermediate between the dark form of eastern Afghanistan and the Himalayas to the west of Darjeeling (*beavani*) and the paler Assamese *hopwoodi* which ranges from there on east.

A good series of 11 specimens, several of which are marked "breeding," collected at Thankot just west of Katmandu in central lower Nepal from March 22 to April 14, are typical dark *beavani*. I have not seen, nor do I know of, any specimens of *beavani* collected to the east of Darjeeling. All of my specimens east of that locality, from Sikkim to south-eastern Bengal, around the Brahmaputra, northern Cachar, and Assam, are the unmistakably paler *hopwoodi*. This distribution and the intermediate breeding specimen from Darjeeling show that it is in this region that the two races meet and intergrade.

Baker is quite confused as to what the characters of *stevensi* should be. In the original description this form is said to be a "decidedly darker bird than any of the more eastern forms" (i.e., *hopwoodi*), while in 1924 (p. 362) he says exactly the opposite, *stevensi* being then described as "neither so large or dark as *D. l. hopwoodi* on the East." The confusion is probably caused by birds, such as the type, which are intermediate in color and therefore darker than typical *hopwoodi*. This latter is very variable in color throughout its enormous range, being, for one instance, distinctly lighter in Assam and Cachar than in near-by northern Burma. It is difficult to know therefore what populations of *hopwoodi* were used by Baker for the basis of his second statement.

In any case, the birds from the given range of *stevensi* I find to be either *beavani* on the west or *hopwoodi* on the east. Since the type itself is intermediate between the two and the type locality and region are a zone of intergradation, *stevensi* must be relegated to the synonymy. The question is whether it should be a synonym of *beavani* or *hopwoodi*. As Baker's second statement shows that he finally considers *stevensi* to be a light rather than a dark form, it perhaps is best to make it a synonym of *hopwoodi*.

The breeding range of *hopwoodi* is very ex-

tensive. The western boundary is from Darjeeling down through eastern Bengal; the northern boundary sweeps to the north of northern Burma and northern Yunnan to western Szechwan, while on the east it runs through the western parts of Kweichow, Kwangsi, and southwestern Kwangtung. Series of specimens, despite many gaps, allow the southern limits of the breeding range to be drawn as a line starting in the lower Chin Hills, and, according to Baker, in the Chittagong Hill Tracts. We have two apparently breeding birds collected at Mount Victoria in the lower Chin Hills. One is an adult female taken on March 20 with the notation that the ovaries are enlarged, and the other is an adult male taken on March 11 with the testes "somewhat enlarged." These birds are properly speaking not true *hopwoodi* but appear to be intermediate between it and *mouhoti*, and I have listed them under the latter. It might be objected that they could still be migrants on the way north, but since there does not seem to be any doubt that they are intermediates, I think they belong not far away. At any rate, somewhere in the lower Chin Hills *mouhoti* passes into *hopwoodi*.

From the lower Chin Hills the line turns north along the Chindwin and, cutting across the northern part of central Burma, dips down through the eastern Northern Shan States and the extreme eastern Southern Shan States, then follows the Mekong until it turns south at Luangprabang and from there cuts to the South China Sea through northern Laos and extreme northern Annam.

In central Burma, at Maymyo, the breeding form is *mouhoti* as shown by an adult male ("had bred this season") collected on June 12. Our series from Loimwe, Kengtung, extreme eastern Southern Shan States, was unfortunately collected in February, and the birds may be migrants. From then on above the Mekong our breeding birds are all *hopwoodi*, but somewhere in western Laos and northern or north central Annam it intergrades with *mouhoti*. The latter is the breeding form in central Annam, for we have young specimens of *mouhoti* collected on July 17 at a point "100 Km. southwest of Vinh."

Ticehurst (1936, p. 279), speaking of *hopwoodi*, says, "This race is recorded in Laos and Tonkin by Delacour, though the few I

have seen thence do not appear to differ from *mouhoti*." My breeding specimens from southern Yunnan, northern Laos, and Tonkin are identical. Probably migrants from those regions are birds identical with them in color and size, collected in winter on Hainan Island and southern Laos. All of these specimens, breeders and migrants, are a little smaller than the breeding birds of northern Burma and northern Yunnan, but similar in size to those of Assam and Cachar. They are also quite pale, the palest of all *hopwoodi*.

Some of these specimens are very close to *mouhoti*, as witness Ticehurst, and it looks as if some of them are intergrades between the two races. I agree with Delacour and believe, however, that the breeding birds, at least those from northern Laos as well as those of Tonkin, are *hopwoodi* and not *mouhoti*. When all the specimens are compared, together with other specimens still farther north, a nice gradation of color and size is apparent, the birds becoming darker and larger as one goes farther north.

Variations in size and color are also apparent elsewhere within the range.

Mayr (1941) has called attention to the fact that the birds from northern Burma and adjoining parts of Yunnan have a longer wing and tail than typical *hopwoodi* from Assam and Cachar. Although the former are distinctly larger, Mayr has refrained from separating them because of an overlap of more than 25 per cent.

I have reexamined his material, together with additional material from the same regions. I also add a large series from southern Yunnan (Mengtsz) and northern Indochina. In the figures below, I separate, however, the birds of northern Burma from those of northern Yunnan because, even though they are both large, the specimens from northern Burma are distinctly darker, particularly on the lower parts. I also include Ticehurst's figures (1936) for specimens of *hopwoodi* from another region from which I had no material. To conform with the other authors, the measurements of all adults of both sexes are given together. I am omitting the furcation of the tail, as the length of the central tail feather tends to remain the same and the depth of the fork is caused by the length of the outer tail feather.

Dacca and Manipur (Ticehurst): 11 specimens, wing, 140–148; "tail" (O.T.F.), 153–166 (no averages given).

Assam and Cachar (Mayr): 11 specimens, wing, 135–146 (140.20); eight specimens, O.T.F., 151–157 (153.60).

Assam and Cachar (Vaurie): 14 specimens, wing, 135–150 (141.86); O.T.F., 137.5–164 (151.60).

Northern Burma, Yunnan (Tengyueh, Shweli) (Mayr): nine specimens, wing, 143–153 (149.0); O.T.F., 150–168 (160.30).

Northern Burma (Vaurie): four specimens, wing, 140–153 (145.90); O.T.F., 158–165 (161.75).

Northern Yunnan (Tengyueh, Shweli and Likiang Range) (Vaurie): 15 specimens, wing, 139–153.5 (149.30); 13 specimens, O.T.F., 150–170 (160.85).

Southern Yunnan, northern Indochina (Vaurie): 27 specimens, wing, 137–148 (142.43); 24 specimens, O.T.F., 139–157 (148.81).

In the case of Mayr's figures the overlap between the birds from Assam and Cachar and those of northern Yunnan was more than 25 per cent, in my figures the overlap for the wing is 33 per cent and for the O.T.F. 57 per cent. Otherwise the averages agree almost exactly. It is also of interest to note that the measurements of the birds of southern Yunnan and northern Indochina are almost exactly the same as those of Assam and Cachar, the only difference being that the former are just a shade paler.

The following table (table 4) summarizes briefly the variations in *hopwoodi*; only the averages, in round numbers, of the wing and tail length are used, as the range of variation and number of specimens were given above.

Dicrurus leucophaeus mouhoti Walden

Buchanga mouhoti WALDEN, 1870, Ann. Mag. Nat. Hist., ser. 4, vol. 5, p. 220. Cambodia, type locality Angkor, as designated by Riley, 1940, Proc. Biol. Soc. Washington, vol. 53, p. 132.

Blue gray with a slight non-metallic sheen above, lighter below, of a pale soft ashy gray. Frontal band and lores gray black, ear coverts of a lighter gray. Differs from *hopwoodi* in being smaller and paler. Similar in general coloring to *leucophaeus* but a shade paler, a little larger in all measurements, especially

TABLE 4
VARIATION OF THE POPULATIONS OF *D. l. hopwoodi*

	Region	Size	Wing	O.T.F.	Color
A	Assam and Cachar	Small	141	152	Lighter than B
B	Northern Burma	Large	148	161	Darkest
C	Northern Yunnan	Large	149	161	Lighter than A
D	Southern Yunnan, northern Indochina	Small	142	149	Lightest

the tail which is considerably longer and more deeply forked.

SPECIMENS EXAMINED: (Breeding specimens indicated.)

Burma: Chin Hills, Mt. Victoria (March 18), 1 ad. ♂ "testes enlarged," 1 ad. ♀ "ovaries somewhat enlarged," 1 imm. ♀; Arakan, 1 ad. ♀, 1 imm. ♀; Kyeikpadein, near Pegu Town, 1 unsexed imm.; Pegu Town, 1 ad. ♀; Ban Nam Chi Hua, on Salween east of Toungoo, 1 imm. ♀; Southern Shan States, Kallaso (April 15), 1 ad. ♀ "caught on nest, 1 egg"; Maymyo, 1 ad. ♂ (June 12) "had bred," 1 ad. ♂, 1 subad. ♂.

Siam: Northern Siam: Doi Suthep, Chiang Mai, 6 ad. ♂, 2 subad. ♂, 2 ad. ♀, 2 imm. ♀ (1 ad. ♂, 1 subad. ♂ of these were collected on July 25); "Mt. Chung" (probably Ban Choeng Doi, near Chiang Mai), 2 ad. ♂; Doi Chiang Dao, 3 ad. ♂, 1 ad. ♀; Doi Pha Hom Pok, 1 ad. ♀; Doi Langka, 1 subad. ♀; Pang Mae Ton (Doi Langka), 1 subad. ♀; Ban Hong Tan, 1 ad. ♂; Doi Nang Kaeo, 1 ad. ♂; Ban Huai Lao, 1 ad. ♂; Ban Samong, 1 subad. ♂; Ban Bo Sali, 1 subad. ♂; Ban Huai Mae Lit. 1 imm. ♀; Song Khwae Valley, 1 ad. ♂. Western Siam: Ban Um Phang, 1 imm. ♂. Eastern Siam: Muang Khon Kaen, 1 ad. ♂, 1 ad. ♀. Central Laos, "100 Km. southwest of Vinh," (July 17), 1 imm. ♂, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 26.0–29.0 (27.13); female, 26.5–28.5 (27.31). Wing, male, 134.5–147.0 (139.77); female, 131.0–141.0 (135.78). C.T.F., male, 89.0–101.0 (96.56); female, 92.0–100.0 (96.0). O.T.F., male, 135.0–154.0 (147.16); female, 135.0–148.0 (141.37). Depth of fork, male, 41.0–56.0 (50.56); female, 42.0–52.0 (46.0).

RANGE: Arakan, southern Chin Hills (where it intergrades with *hopwoodi*), central and upper southern Burma, western Northern Shan States, Southern Shan States (with the possible exception of the extreme eastern part where it may intergrade with *hopwoodi*), northern Siam, northeastern Siam, western

Laos (where it intergrades with *hopwoodi*), central Laos, and central Annam. Migrates to winter in southern Burma, southern Siam, Cambodia, and perhaps Cochinchina.

DISCUSSION: Deignan (1946, p. 3) showed that the breeding form on the northern plateau of Siam is *mouhoti* and that south of this region at about latitude 17° 47' N., in the lowlands of central Siam, this form is replaced as a breeder by the smaller *bondi*.

Working independently with the same material, I had reached the same conclusion, and since I agree entirely with Deignan I quote his results:

"a. All summer-taken birds from Siam south of the northern plateau are *bondi*, with tail length of nonmolting adults (pygostyle to end of outermost rectrix) ranging from 112.1 to 130.1 mm.;

"b. All summer-taken birds from the northern plateau are *mouhoti*, with tail length of nonmolting adults ranging from 139 to 151.2 mm., the general coloration averaging rather darker, and the lores and frontal region distinctly blackened;

"c. Every specimen possessing the characters of *mouhoti*, but coming from within the breeding range of *bondi*, has been collected in winter."

My figures for the length of the outer tail feather (including additional material) are, for *bondi*, from 119.0 to 133.0, average (126.50) and for *mouhoti*, 135.0 to 154.0 (147.16). They agree substantially with Deignan's figures.

The difference in color between the two races is more difficult to assess. Generally speaking, *mouhoti* tends to be darker; this is particularly true, especially on the back, when *mouhoti* is compared with the paratypes of *bondi*. However, I can see no difference in color between some breeding specimens of

mouhoti collected at Doi Suthep in northern Siam and other breeding specimens of *bondi* collected at Dalat in southern Annam.

The type of *mouhoti* was described by Walden from a bird collected in Cambodia; no sex, locality, or date was given. Riley (1940) designated Angkor as the type locality. The measurements given for the type are $5\frac{2}{3}$ inches [=133.35 mm.] for the wing, and $5\frac{8}{8}$ inches [=146.0 mm.] for the tail. Of 28 of my specimens of *mouhoti*, only three females have so short a wing. Adult males of *mouhoti* range from 134.5 to 147 (139.77) and adult females from 131.0 to 141.0 (135.78). Twenty-two adults of *bondi* of both sexes range from 125.0 to 138.0 (132.0). The length of the O.T.F. (146.0), however, is just that of the average of 19 adult males of *mouhoti* (147.16), such a measurement being much too long for *bondi* where 10 adult males range from 119.0 to 133.0 (126.50).

I have not examined the type of *mouhoti* and therefore cannot satisfy myself as to its color. Perhaps too much reliance should not be placed as to relative paleness or darkness. In *hopwoodi*, *mouhoti*, and *bondi*, as well as in *leucophaeus*, evidence shows this character to be quite variable. With the exception of the somewhat short wing the measurement of the type, at least for the tail, matches definitely that of the birds that breed in central Burma and northern Siam. Despite the fact that this bird was not collected within the breeding range of *mouhoti*, it was probably a non-breeding migrant from the north.

Dicrurus leucophaeus bondi de Schauensee

Dicrurus bondi DE SCHAUENSEE, 1937, Proc. Acad. Nat. Sci. Philadelphia, vol. 89, p. 337. Ubol Chanuman [Ban Chanuman, near Ban Khemmarat, eastern Siam on the Mekong]. (Type in Acad. Nat. Sci. Philadelphia).

Dicrurus leucophaeus rocki RILEY, 1940, Proc. Biol. Soc. Washington, vol. 53, p. 132. Arbrey Broyé [between Dalat and Dran, southern Annam]. (Type in U.S.N.M.).

Similar to *mouhoti* but smaller, and averaging paler.

SPECIMENS EXAMINED: (Date of all specimens indicated.)

Siam: Central Siam: Ban Tha Chang Tai (July 5), 1 imm. ♂; Mae Tha Khwae (June 25), 1 imm. ♂; Mae Lam Phan (September 15), 1 ad. ♀; Ban Mae Phun (August 31), 1 ad. ♀. Eastern Siam:

Ban Chanuman (January 12), 1 ad. ♂; Ban Khulu (December 22), 1 subad. ♂ (the paratypes of *D. bondi*).

Southern Laos: Thateng (December 9–21), 3 ad. ♂, 1 subad. ♂, 1 ad. ♀, 1 subad. ♀; Phu Tongtul (November 26), 1 ad. ♂; Bantiou (December 5), 1 ad. ♀.

Southern Annam: Forest of Arbrey Broyé, between Dalat and Dran (October), 1 ad. ♂ (the type of *D. l. rocki*); Arbrey Broyé (July), 1 ad. ♀; Dran (May 12 through July), 3 ad. ♂, 1 imm. ♂, 3 ad. ♀; Dalat (June–July), 1 imm. ♀, 1 unsexed ad.; Le Bosquet, "7 miles east of Dalat" (May 7), 1 ad. ♀; Forest of Fimnon, near Dalat and Djiring (two specimens in August, the rest in October–November), 3 ad. ♂, 1 ad. ♂ [?], 2 ad. ♀; "on road to Ban Methuot, 60 Km. from Saigon Road" (February), 1 ad. ♂. Except for two specimens from Dran, the specimens in this paragraph are the original series from which *D. l. rocki* was described.

MEASUREMENTS: Length of bill, male, 24.0–27.5 (25.70); female, 24.5–26.0 (25.43). Wing, male, 128.0–138.0 (132.89); female, 124.0–135.5 (129.55). C.T.F., male, 86.0–95.0 (91.25); female, 84.5–96.0 (91.20). O.T.F., male, 119.0–133.0 (126.50); female, 120.0–130.0 (125.0). Depth of fork, male, 23.0–40.0 (34.70); female, 28.0–40.0 (34.85).

RANGE: From Cambodia, southern Laos, and southern Annam, westward across Siam to the Me Ping, south of latitude 17°47' N.

DISCUSSION: Deignan (1946) shows that, in series, *rocki* is inseparable from *bondi*.

The latter was described from three adult specimens, two of which, including the type, are unusually pale, while the third is darker. Riley described *rocki* as "averaging slightly darker" than *mouhoti* and as being "similar to *D. bondi* but darker." I have examined the two paratypes of *bondi* as well as the type and paratypes of *rocki*. The darker specimen of *bondi* cannot be separated in color from most of the paratypes of *rocki*, and in measurements all *rocki* specimens are identical with *bondi*.

Since *rocki* cannot be separated by measurements and, as a series, matches in color the darker of the paratypes of *bondi*, I fully agree with Deignan that the two are inseparable and that *rocki* is only a synonym of *bondi*.

Dicrurus leucophaeus nigrescens Oates

Dicrurus intermedius BLYTH, 1846 (not *Edolius intermedius* Lesson, 1831, Traité d'ornithologie,

p. 380), Jour. Asiatic Soc. Bengal, vol. 15, p. 298. Penang.

Dicrurus nigrescens OATES, 1889, The fauna of British India, vol. 1, pp. 311, 315. Kyeikpaden, near Pegu Town.

Dicrurus leucophaeus disturbans BAKER, 1918, Novitates Zool., vol. 25, p. 293. Amherst.

Dark slaty gray with dull blue gloss above, reminiscent of the dark Indian races (*beavani* and *longicaudatus*), but paler and lighter gray below, and distinctly smaller, particularly the tail. Frontal band and lores dusky black, ear coverts gray.

SPECIMENS EXAMINED: A. Tenasserim: Amherst, 1 ad. ♀; Lampha, 58 miles east of Moulmein, 1 ad. ♂; upper Tavoy River Valley, 1 imm. ♂.

B. Head of the Gulf of Siam: Ban Thun Luang, 1 ad. ♂; Pranburi, 1 ad. ♂; Bangkok, 1 ad. ♂, 1 ad. ♀; Ban Si Racha, 1 subad. ♂; Rayong, 1 ad. ♀; Khao Seming Krat (= Ban Bang Phra), 7 ad. ♂, 1 ad. ♀; Ko Chang Island, 2 ad. ♂, 1 subad. ♂, 3 ad. ♀, 1 subad. ♀; Ko Klum Island, 1 ad. ♂; Ok Yam, Franco-Siamese boundary on coast, 1 ad. ♂.

MEASUREMENTS (SPECIMENS FROM PARAGRAPH A ONLY): Length of bill, male, 28.0; female, 28.5. Wing, male, 135.0; female, 132.5. C.T.F., male, 97.0; female, 93.0. O.T.F., male, 146.0; female, 139.0. Depth of fork, male, 49.0; female, 46.0.

RANGE: From the plains of extreme southern Burma down through Tenasserim and the Malay Peninsula as far south as Kedah and lower Perak (Sitiawan, near Lumut) (Chasen), Junk Seylon, and Penang Islands. Appears to intergrade with the pale resident form in extreme southern Burma, western Siam, and around the head of the Gulf of Siam and its islands.

DISCUSSION: Both Robinson and Kloss (1924b) and Ticehurst (1936) show correctly that the "Dark Ashy Drongo," which is found extending from southern Burma (Pegu) down the Malay Peninsula to about Perak, is very similar to the dark races of India, differing only by being smaller and by having a paler, grayer abdomen.

Prior to Ticehurst there had been much confusion over this dark bird. Three supposedly distinct forms had been named: *intermedius* from Penang, *nigrescens* from Pegu, and *disturbans* from Amherst. Ticehurst went into this question very carefully; he compared a series of measurements from

various parts of the range and examined the types of *nigrescens* and *disturbans*, together with topotypical specimens of *intermedius*. His conclusions (1936, p. 278) were that there is but one form, and he accordingly united all the "Dark Ashy Drongos" from Pegu to Perak under "Blyth's prior name of *intermedius*, with *nigrescens* and *disturbans* as synonyms."

I wish I could keep the nomenclature as Ticehurst left it, but unfortunately, since *Dicrurus intermedius* of Blyth (1846) is pre-occupied by *Edolius intermedius* of Lesson (1831), and *Edolius* has been merged under *Dicrurus*, the correct name must be that next available, which is *Dicrurus nigrescens* Oates.

I have placed "Dark Ashy" and "Pale Ashy" in quotes because Ticehurst adopts these terms to make the point that he considers the two to be specifically distinct from each other. The revision of the ashy drongos as a whole leads me, however, to believe that the "dark" *longicaudatus* is not specifically distinct from the "pale" *leucophaeus*.

The specimens listed in paragraph B are very interesting. No matter how many times they are compared to typical specimens of both the dark and pale forms, the evidence is inescapable that these birds are intergrades between the two. Some are identical with a specimen from Amherst, others are closer to the pale specimens that breed in central Burma and northern Siam (*mouhoti*) and in central Siam and southern Annam (*bondi*), and there are all kinds of intermediate grades.

Unfortunately none were collected during the breeding season, and some of the palest, in view of the variability in depth of color that exists, could be migrants from farther north. My figures for the wing length would seem to indicate that, if this should be the case, these migrants are *mouhoti*. However, granting that some are migrants, this does not dispose of the fact that some of these specimens are still considerably darker than any *mouhoti* I have examined and that some are inseparable from dark typical *nigrescens* from Amherst.

Collecting during the breeding season on both sides of the Gulf would show what the true situation is. Meanwhile, I am led to believe that in the northern part of its range (extreme southern Burma and southwestern Siam possibly, and around both sides of the

head of the Gulf of Siam), *nigrescens* intergrades with *mouhoti* in the north and west and with *bondi* in the south and east. If this can be shown by breeding specimens, it would provide another instance of the intergradation between the dark (*longicaudatus*) and the pale (*leucophaeus*) forms, and there could no longer be any doubt that the two are conspecific (I have shown elsewhere, under *hopwoodi*, that this intergradation does take place at around Darjeeling).

Dr. Mayr has suggested that *nigrescens* may have reached the Malay Peninsula by way of Sumatra. It should be noted that the northern populations of Sumatra are darker than the southern. Also the white loreal spot which is present in the southern birds has almost completely disappeared in the northern birds and is absent altogether in *nigrescens*. The possibility that the birds reached the peninsula by way of Sumatra would receive added support if comparison showed the peninsular birds to be paler in the south than in the north. Unfortunately, no specimens of *nigrescens* were available south of the "upper Tavoy River Valley," or about latitude 15° N.

Since I have only two specimens of *nigrescens* from the northern part of its range, I am giving an additional series of measurements from various parts, as it was given by Ticehurst (1936, p. 277):

Malay (Kloss)	9 ♂ ♀
Southern Tenasserim	3 ♂ 2 ♀
Amherst and district	13 ♂ 9 ♀
Pegu	5 ♂ 5 ♀

The same individual measurements of the birds in paragraph B of the list of specimens, with the two adults from paragraph A inserted, are for adults only:

Wing: 14 males, 134.5, 135 (Lampha), 136, 137, 138, 138, 139, 139, 139, 140, 140, 144, 144, 145 (139.18); eight females, 130, 132, 132.5 (Amherst), 136, 138, 139.5, 140, 140 (136.0).

O.T.F.: 13 males, 130, 133.5, 136, 138, 138,

143, 144, 145, 146 146 (Lampha), 147, 148, 150 (142.0); eight females, 123, 131.5, 133, 139, 139 (Amherst), 141, 142, 146 (136.80).

Fork: 12 males, 40, 40, 42, 43, 43, 43, 46, 48, 49, 49 (Lampha), 49.5, 50 (45.20); eight females, 29, 33.5, 34.5, 35, 42, 45, 46, 46 (Amherst), (36.88).

Dicrurus leucophaeus leucogenis Walden

Buchanga leucogenis WALDEN, 1870, Ann. Mag. Nat. Hist., ser. 4, vol. 5, p. 219. Nagasaki, Japan, error; type locality corrected to China by Baker, 1921, Jour. Bombay Nat. Hist. Soc., vol. 27, p. 474; restricted to Ichang, Hupeh, by Deignan, 1945, Birds of northern Thailand, Bull. U. S. Natl. Mus., no. 186, p. 289.

Buchanga leucogenys cerussata BANGS AND PHILLIPS, 1914, Bull. Mus. Comp. Zool., vol. 58, p. 302. Ichang, Hupeh.

Delicate pale French gray, almost whitish. Frontal band and chin blackish. A pure white, sharply defined oval patch on each side of the head extends from the bill to well beyond the cheeks. Under wing coverts whitish. Immatures have the plumage darker and less pure, and the white patch is less distinct.

SPECIMENS EXAMINED: (All the following specimens were collected during the breeding season.)

China: Kansu, Hai hsian, 1 unsexed ad. Eastern Szechwan, Wanhsien, 1 ad. ♂, 1 ad. ♀. Hupeh, Ichang, 1 ad. ♂; Hankow, 1 unsexed ad. Northern

WING	TAIL	FORK
123-134	124-138	—
131-138.5	129-141	36-41
122, 127.5	123, 127	32, 35
128-135	129-140	35-45
126-134	128-141	—
129-133	133-140	40-48
123.5-129!	131-133	34-41
	(one 160)!	

Kiangsi, Kiukiang (on the Yangtze), 1 unsexed ad. Anhwei, Chinteh, 1 ad. ♂; Tatung, 2 ad. ♀, 1 unsexed juv., "a day out of the nest." Kiangsu, Chinkiang, 9 ad. ♂, 2 ♀. Chekiang, Ningpo, 1 ad. ♂. Fukien, Futsing, 3 ad. ♂, 1 ad. ♀; Foochow, 1 unsexed ad.

MEASUREMENTS: Length of bill, male, 24.0-27.5 (26.20); female, 25.8-26.5 (26.07). Wing, male, 138.0-148.0 (142.78); female, 132.5-140.0 (136.50). C.T.F., male, 98.0-

107.0 (102.76); female, 107.0. O.T.F., male, 126.0–143.0 (131.85); female, 135.0. Depth of fork, male, 21.5–34.5 (29.0); female, 28.0.

RANGE: China, north from the Yangtze as far as the interior of Manchuria (La Touche), coastal China north from Fukien, and possibly northeastern Kwangtung. Intergrades with *salangensis* along the Yangtze. Migrates through southeastern China, Indochina, Siam (mostly in the east and southeast, though two specimens were recorded by Riley from northern Siam on April 18 and 21 in the vicinity of Nan), to Tenasserim and the northern part of the Malay Peninsula (Kloss, 1931).

DISCUSSION: La Touche (1926, p. 208) states, "According to Père David this Drongo travels through Central China in small numbers, and passes Peking twice a year, going as far as the interior of Manchuria, where it nests." Farther south, La Touche says that the bird arrives on the lower Yangtze in May, and he includes in the range Szechwan, Hupeh, Anhwei, Kiangsi, Chekiang, and Fukien where he has found it arriving in Foochow in large numbers in April, starting to nest there in early May. Kwangtung is also included where the bird has been reported in summer as well as on migration.

Gee, Moffett, and Wilder (1926) give the same data as La Touche for *leucogenis*. They record the more southern form (*salangensis*) as breeding in Hupeh, Chekiang, Kiangsi, Kwangtung, and Fukien, and found in southern Yunnan in September and October, and Hainan in winter.

Some of my specimens along the Yangtze (Wanhsien, Hankow, Kiukiang, Tatung, as well as two or three from my good series from Chinkiang) are darker both above and below than typical *leucogenis* but not nearly so dark as *salangensis*, and on some the white patch is restricted. These birds seem to be intermediate and show that the two races meet inland along the Yangtze and intergrade. Along the coast, however, the range of *leucogenis* comes farther south, all my specimens from Fukien being typical of the lighter race.

According to my specimens, my interpretation of the breeding records as given by La Touche, and Gee, Moffett, and Wilder would be that the line inland separating the two

rates is, roughly speaking, the Yangtze, and that it then follows the coast south as far as southern Fukien and possibly the eastern end of Kwangtung.

Dicrurus leucophaeus salangensis Reichenow

Dicrurus leucogenys var. *salangensis* REICHENOW, 1890, Nomenclator Musei Heineani ornithologici, p. 69. "Insula Salanga" [Junk Seylon or Phuket].

Dicrurus leucogenys meridionalis HACHISUKA, 1926, Bull. Brit. Ornith. Club, vol. 47, p. 56. Seven Finger Range, central Hainan.

Similar to *leucogenis* but considerably darker both above and below. Frontal band and chin as in *leucogenis* but the former not contrasting so conspicuously with the crown. The white patch not so sharply defined, always a little drab and seldom pure white, smaller as a rule, extending only over the ear coverts and not to the sides of the neck. Under wing coverts darker, the whitish color confined to the edges and tips of the feathers. Immatures slightly darker and the white patch still less distinct.

SPECIMENS EXAMINED: (Only the specimens in paragraph A are breeders; those in paragraph B are all migrants.)

A. China: Hupeh, Cock's head (=Chi Kong Shan), on the Yangtze "80 miles below Hankow" (June 19), 1 imm. ♀; Tunghie, same vicinity (June 15), 1 ad. ♀ "ovary enlarged." Fukien, no locality, 1 imm. ♂.

B. Hainan Island (all collected from September 23 to April 6): No Tai, 2 imm. ♂, 4 imm. ♀; Lei Mui Mon, 3 ad. ♂, 2 imm. ♂, 1 ad. ♀; Namro, 1 unsexed ad.; Nodda, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀; Five Finger Range, 1 ad. ♂. (All the following specimens collected from November 20 to January 28): Bangkok to Malacca: Bangkok, 1 unsexed ad.; Tenasserim, Bofeyin, 1 ad. ♂; northern Malay Peninsula, Chong Prang, 1 ad. ♂; Pulau Panjan Anak, 1 ad. ♂; Gherbi, Nongkok, 1 ad. ♀; peninsular Siam, no locality, 1 unsexed ad.; Perlis-Siam border, Padang Sireh, 1 ad. ♀; Gunong Tahan, 1 ad. ♀; Malacca, 1 imm. ♂.

MEASUREMENTS: Length of bill, male, 23.0–28.0 (26.07); female, 24.0–28.0 (26.05). Wing, male, 139.0–145.0 (143.0); female, 137.0–145.0 (141.50). C.T.F., male, 100.5–108.0 (103.21); female, 101.0–108.5 (104.41). O.T.F., male, 130.0–141.5 (136.36); female, 129.0–131.0 (131.33), an additional one, 150.0!

Depth of fork, male, 29.0–37.5 (33.16); female, 27.0–30.0 (29.0).

RANGE: Southeastern China inland, south from the Yangtze, along which it intergrades with *leucogenis*, and on the coast south from the Fukien-Kwangtung boundary. Migrates to Hainan, and through Indochina and eastern and southern Siam to the Malay Peninsula as far south as Malacca.

DISCUSSION: I agree entirely with Riley (1938) and Deignan's supporting view (1945) that the *Buchanga leucogenis* of Walden is the northern paler race. The original description, "pale, delicate, slate gray or French gray . . . pure white oval patch extending . . . to beyond the cheeks" is very explicit and leaves no doubt that Walden was describing the lighter form. The *Buchanga leucogenys cerussata* of Bangs and Phillips is then but a renaming of the paler form, and the darker bird must be called *salangensis*. Reichenow's *salangensis* was a migrant on Salanga (Junk Seylon), and I have winter specimens from that vicinity. They are the darker form and have the "*regione parotica cinerea nec alba*" of Reichenow's description which is typical of the darker form.

The breeding range of *salangensis* is south and inland (on the coast) from that of *leucogenis*. Although specimens or records are not existent, I would expect it to be the breeding form in Hunan, eastern Kweichow, most of Kiangsi, Kwangsi, and Kwangtung. La Touche (1926) reports *hopwoodi* as resident in southeastern Yunnan and found in Kwangsi and Kwangtung in summer, further stating that it is "apparently only a rare visitor to South-East China." Just where the two meet I cannot say exactly, but probably somewhere along the western borders of Kweichow and Kwangsi. I have examined four specimens of *hopwoodi* from Hwangtsaopa in extreme southwestern Kweichow. They were collected from September 7 to 11 and, as they are in the midst of moulting, they would appear to have been bred locally. The northern half of Kwangtung would seem to be a little too far east for *hopwoodi* to be found there regularly. The only record about which any particulars are given is "one stray bird in winter in Hongkong," and of one other at Takhing (no particulars given).

Hachisuka's *meridionalis* is based on a

small series collected in the Seven Finger Range of central Hainan. The type is given as collected on November 16. It is not stated when the other specimens were collected, but the author's remark that "The breeding of this bird in Hainan has not been recorded, and Dr. Hartert, Nov. Zool, 17, p. 249, suggested that the bird here described was possibly on a winter visit to the island, but I think it is a resident in the high mountains," implies that they were also collected in winter.

Even though Hachisuka compares his so-called new form to *leucogenis* and says that it differs from it by being darker, I have never found a specimen of this lighter race from Hainan, all authors, as well as my specimens of *leucogenis*, showing that it migrates instead to the Malay Peninsula. But I have a good series taken, as were Hachisuka's specimens, in the winter in the mountains of central Hainan. These specimens do not differ in color, size, or any other character from the darker *salangensis*. These are the same specimens that were reported on by Hartert (1910, p. 248), and I fully agree with him that the darker " . . . is only a winter visitor on the island of Hainan."

Hachisuka is right in that his winter birds differ from *leucogenis*, but they do not differ from the darker *salangensis*, the existence of which he apparently ignores, and to which the comparison should have been made. The evidence of my specimens from the mountains of central Hainan and the time of the year at which they and Hachisuka's specimens were collected therefore make it very obvious that *meridionalis* is merely a renaming of migrant *salangensis*.

Dicrurus leucophaeus innexus Swinhoe

Buchanga innexa SWINHOE, 1870, Ibis, p. 246. Chinlan River, Wenchang District, northeastern Hainan.

General color as in *mouhoti* but a little darker on the throat and upper breast, lighter than *hopwoodi* and darker than *salangensis*. Lores and ear coverts more or less dusky white and vaguely defined, the white always tinged with gray. Under wing coverts uniformly gray. Tail intermediate in length and depth of fork between the Chinese races (*leucogenis* and *salangensis*) and *mouhoti*. With the exception of a few speci-

mens of *hopwoodi* the bill is slightly heavier and deeper than in all other races of the Ashy Drongo.

SPECIMENS EXAMINED: (All collected during the breeding season from April 10 to May 30.) Hainan: Secha, 2 ad. ♂, 2 subad. ♂, 3 ad. ♀, 1 subad. ♀.

MEASUREMENTS: Length of bill, male, 26.5, 28.5 (27.50); female, 25.0–28.5 (27.16). Wing, male, 140.0, 142.0 (141.0); female, 138.5–142.0 (140.83). C.T.F., male, 98.0, 101.0 (99.50); female, 98.0–104.0 (100.66). O.T.F., male, 139.0, 139.0; female, 136.0–141.0 (138.33). Depth of fork, male, 38.0, 41.0 (39.50); female, 36.0–40.0 (37.66).

RANGE: Hainan Island.

DISCUSSION: This form is one of the most interesting of all the races of the Ashy Drongos. As I have mentioned in the Introduction, Stresemann (1930) and Kloss (1931), working with Sumatran birds, had reached the opinion that the White Cheeked Drongos were conspecific with the Ashy Drongos. *D. l. innexus* furnishes a perfect proof of the correctness of their views, as it is an intergrade in every way between the two.

That *innexus* is a striking intermediate was at once recognized by Swinhoe who describes it as "intermediate in size and colour between the last two [*leucogenis* and *mouhoti*]," and he emphasizes this point throughout. Hartert (1910, p. 249) states that some of his specimens from Hainan "look exactly as if they were hybrids between *D. cineraceus* [= *leucophaeus*] and *D. leucogenis*."

Hartert's material is now in the collection of the American Museum, and examination shows that, of the specimens enumerated by him under *innexus*, those with dark lores and ear coverts are all winter birds collected from November to March, only the series collected at Secha from April 10 to May 30 showing the whitish face marks.

I agree with Swinhoe when he considers that the dark-faced birds in Hainan are "*mouhoti*," or rather *hopwoodi*, for in Swinhoe's time *hopwoodi* had not as yet been separated from *mouhoti*. But even of this future distinction Swinhoe had a hint when he remarks that on Hainan his "*mouhoti*" are larger.

The Secha series is not uniform. Some of the

birds are darker than others, and these show only the faintest suggestion of white on the lores and ear coverts. These latter specimens also are in very abraded plumage and do not appear to be fully adult. On one of them the lores and ear coverts are beginning to moult, the new feathers appearing to come in whitish. The fully adult specimens are the palest and have the whitish lores and ear coverts well marked. I believe, therefore, that, as in the case of *leucogenis* and *salangensis*, the younger birds are darker and obtain the paler plumage and the maximum development of the whitish face mark only upon maturity.

Three races of *leucophaeus* are found on Hainan, and I summarize the situation as it appears to me to be, as follows:

1. *innexus*, the breeding resident form
2. *salangensis* (synonym *meridionalis*), migrant from southern China; arriving on Hainan, according to my specimens, the latter part of September (24) and leaving by the first week in April (6)
3. *hopwoodi*, migrant from northern Indochina and southern Yunnan and perhaps the more western parts of southern China where it replaces *salangensis*; arriving in the fall (my first record is November 20 but it probably arrives before this) and leaving by the first week in April (6)

Dicrurus leucophaeus stigmatops Sharpe

Buchanga stigmatops SHARPE, 1879, Proc. Zool. Soc. London, p. 247. Mt. Kina Balu, north-western Borneo. (Type in British Mus.)

Buchanga leucophaea penrissenensis HARRISON AND HARTLEY, 1934, Bull. Brit. Ornith. Club., vol. 54, p. 157. Mt. Penrissen, Sarawak. (Type in Kuching Mus., Sarawak; topotype in Raffles Mus., Singapore.)

Buchanga leucophaea dulitensis HARRISON AND HARTLEY, 1934, Bull. Brit. Ornith. Club., vol. 54, p. 158. Mt. Dulit, Sarawak. (Type in British Mus.)

Similar to *mouhoti* in color but smaller in every measurement. Lores white, the white extending slightly all the way around the eye.

SPECIMENS EXAMINED: Northern Borneo: Mt. Kina Balu, 6 ad. ♂, 1 imm. ♂, 2 ad. ♀, 2 unsexed imm.

MEASUREMENTS: Length of bill, male, 25.0–26.5 (25.67); female, 25.0, 26.0. Wing, male, 127.0–134.0 (129.42); female, 124.0,

128.0 (126.0). C.T.F., male, 87.0–92.5 (89.67); female, 90.0, 91.0. O.T.F., male, 115.0–126.5 (120.09); female, 117.0, 123.0 (120.0). Depth of fork, male, 28.0–34.0 (30.41); female, 27.0, 32.0 (29.50).

RANGE: Mountains of northern Borneo.

DISCUSSION: The two forms separated by Harrison and Hartley under the names *penrissenensis* and *dulitensis* were collected on the mountains of Sarawak in the northwestern part of the island. The Penrissen bird was separated on the basis of being larger than those from Kina Balu and Dulit, the Dulit bird as being darker than those from Penrissen and Kina Balu.

The wing length of the type of *penrissenensis* is given as 142.0 mm. This specimen was an unusually large male for the rest of the series measures, male and female, 132.0 to 137.0. Birds from Kina Balu average slightly smaller, but I have a specimen from this locality with a wing length of 134.0. Harrison and Hartley mention another with 137.0 from Mt. Derian, Kloss (1931) another (no locality) with 138.0.

I had no specimens available for examination from either Mt. Penrissen or Dulit, but Chasen (1935), who had the opportunity of looking into these two so-called new races, makes them synonyms of *stigmatops*, and the same author in the Introduction (p. xii) states "Turning to the mountains we find that, within the island, the great massif of Mt. Kinabalu in the north has fewer peculiar forms than was formerly thought, for recent collecting has shown that it shares most of its birds with other high peaks in North Sarawak. On the neighbouring Mt. Dulit there are signs of independent specialization although these are not so numerous as some recent authors would have us believe."

Dicrurus leucophaeus phaedr Reichenow

Buchanga stigmatops phaedra REICHENOW, 1904, Wissenschaftliche Ergebnisse der Deutschen Tiefsee Expedition, vol. 7, p. 356. Padang, western Sumatra.

Similar to *stigmatops* in color and size but with the white loreal spot smaller, the white extending occasionally very slightly below the eye.

SPECIMENS EXAMINED: West central and south-

western Sumatra: Padang Pandjang, 5 ad. ♂; Padang highlands, 3 unsexed ad., 1 unsexed subad., 2 unsexed imm.; Sungei Penoh, 1 ad. ♂; Siolah Dras, 1 ad. ♂; Kerintji Valley, Sungei Kumbang, 1 ad. ♀, 1 imm. ♀; Dempo, 1 subad. ♂, 1 imm. ♀. Sumatra, no locality, but typical of *phaedr*, 2 ad. ♂.

MEASUREMENTS: Length of bill, male, 25.0–26.5 (25.59); female, 26.0. Wing, male, 123.0–134.5 (128.95); female, 124.0. C.T.F., male, 85.0–94.0 (89.17); female, 87.0. O.T.F., male, 114.5–126.0 (120.18). Depth of fork, male, 26.0–35.0 (30.50).

RANGE: Sumatra, south of latitude 1° 30' N.

DISCUSSION: This form is discussed with *batakensis*.

Dicrurus leucophaeus batakensis Robinson and Kloss

Buchanga leucophaea batakensis ROBINSON AND KLOSS, 1919, Jour. Straits Branch Roy. Asiatic Soc., vol. 80, p. 125. Bandar Baroe, Deli, north-eastern Sumatra. (Type in A.M.N.H.)

Similar to *phaedr* but a little darker and with lores gray or occasionally with a scarcely perceptible trace of dusky white. Very close to *leucophaeus* from which it differs by an occasional trace of white on the lores, and by being slightly lighter and having a shorter tail.

SPECIMENS EXAMINED: Northern Sumatra: Deli: Bandar Baroe, 1 ad. ♂ (the type of *B. l. batakensis*), 1 ad. ♂, 1 imm. ♂, 1 ad. ♀ ("co-type"), 1 ad. ♀, 1 imm. ♀; Sibajak, 1 ad. ♂, 1 ad. ♀; these specimens from Deli are the original series. Atjeh, Tretet, 1 ad. ♂, 3 unsexed ad., 1 unsexed subad.; Agusan River, Koengke, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀, 2 imm. ♀; Blangnanga, 1 ad. ♂. Parpareian, 1 ad. ♂ (not located, said to be in western Sumatra, but specimen appears to be *batakensis* rather than *phaedr*).

MEASUREMENTS: Length of bill, male, 25.0–27.5 (26.21); female, 26.0–27.0 (26.50). Wing, male, 127.0–134.0 (130.21); female, 124.5–131.0 (127.87). C.T.F., male, 88.0–94.0 (91.50); female, 88.0–90.5 (89.16). O.T.F., male, 113.0–126.0 (120.0); female, 114.5–122.0 (119.0). Depth of fork, male, 22.0–33.0 (28.40); female, 25.5–34.0 (30.50).

RANGE: Northern Sumatra, north of latitude 1°30' N.

DISCUSSION: Robinson and Kloss in 1919

gave the name *batakensis* to the birds found in northern Sumatra, but Kloss in 1931 (p. 358) came to the opinion that the birds from this region were not after all really separable from those from the rest of Sumatra saying, "with more material now in hand it appears that the characters relied on for distinguishing *batakensis*, viz., 'no black frontal band and grey lores not very clearly defined but still paler than the forehead' are of no value. In both Bornean and Sumatran birds the lores vary from white to greyish and the black forehead may be present or absent." The additional material mentioned by Kloss apparently consists of only two specimens, one an adult female from Palembang, and the other an immature female from Redelong (Redelong is in northern Sumatra, 30 miles inland, south of Bireuen and about 10 miles from Lake Tawar). The bird from Redelong "is darker than the adult and has grey lores."

Redelong is within the range of the northern form, and examination of my specimens shows that, although the white loreal spot in the immature specimens of *phaedrus* is not so sharply defined as in the adults, it is nevertheless always present, while the opposite is true of immature specimens from northern Sumatra. Kloss' statement that the bird of Redelong has grey lores is significant, and since this is also true of other immature specimens from northern Sumatra, but not of those from southern Sumatra, I believe that the difference is not merely due to age but that it is characteristic of *batakensis*. The fact that the northern bird from Redelong is darker than the southern bird from Palembang is also significant, as the northern *batakensis* is consistently a little darker than the more southern *phaedrus*.

I have available the type and paratypes of *batakensis* (eight specimens) plus 12 other specimens from northern Sumatra, and I have compared these with 11 specimens from Padang, four from Kerintji, and two from Dempo: all of these localities are in western, southwestern, and southern Sumatra. I find that the difference between the birds from northern Sumatra and those from farther south is consistent and easily told. There are no white loreal spots in the northern birds; in a few specimens the loreal area is lighter than the surrounding feathers but is never white

nor is it clearly defined. I think therefore that attention should be called to this difference and that the name *batakensis* should be maintained for the northern birds.

The frontal band varies as to plumage. I think I can detect a color difference between *batakensis* and *phaedrus*, the former being slightly but definitely darker.

I have selected more or less arbitrarily latitude 1°30' N. as the line separating the two races. I have no specimens from exactly that latitude, but I am basing it on Kloss' statement (1931) that at about this latitude the Padang Sidempuan depression appears to be the boundary of a number of forms of birds as well as mammals confined to the northern part of Sumatra.

It is very interesting to note that except for a small size difference and an occasional hint of white on the lores *batakensis* is so close to *leucophaeus* as to be its replica. Together with its very close relative *phaedrus*, *batakensis* gives another illustration (another being *innexus* on Hainan) of the passing over of the forms with white lores and faces to those with solid gray lores, thus showing again that they must be regarded as conspecific.

Dicrurus leucophaeus periophthalmicus Salvadori

Buchanga periophthalmica SALVADORI, 1894, Ann. Mus. Civ. Genova, ser. 2, vol. 14, p. 594. Si Oban, Sipora Island, Mentawai group. (Types b and e of the author's series in A.M.N.H.)

Dicrurus leucogenis diporus OBERHOLSER, 1912, Smithsonian Misc. Coll., vol. 60, no. 7, p. 15. North Pagi Island, Mentawai group. (Type in U.S.N.M.)

Same general pale blue gray color of *mouhoti* and *leucophaeus* but with a large white facial area similar in extent to that of the Chinese races (*leucogenis* and *salangensis*).

SPECIMENS EXAMINED: Mentawai Islands, western Sumatra: Sipora, Si Oban, 1 ad. ♂, 1 ad. ♀ (types b and e of *B. periophthalmica*); Sipora, 1 ad. ♂, 1 subad. ♂, 3 ad. ♀. North Pagi, 1 ad. ♂; 1 ad. ♂ (the type of *D. l. diporus*), 2 ad. ♂, 1 ad. ♀ (the paratypes of *D. l. diporus*); Sikakap Strait, 1 subad. ♂, 1 unsexed subad. South Pagi, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 27.0–30.0 (28.21); female, 27.0–29.0 (27.80).

Wing, male, 137.5–143.5 (139.41); female, 133.0–141.0 (138.0). C.T.F., male, 95.0–101.0 (98.16); female, 97.5–103.0 (99.50), one, 113.0. O.T.F., male, 128.0–135.0 (131.79); female, 128.0–137.5 (133.50). Depth of fork, male, 29.0–37.0 (33.66); female, 24.5–32.0 (29.0).

RANGE: Sipora, North and South Pagi Islands, Mentawai group, western Sumatra.

DISCUSSION: With this form (*periophthalmicus*) and the one from neighboring Siberut Island (*siberu*) we return to populations having a full white face similar to those of the races of China (*leucogenis* and *salangensis*); while in the other neighboring races of Sumatra it is interesting to note to what an extent the white area has receded, being limited to the lores in *phaedrus* and to an occasional hint in *batakensis*, to, finally, total disappearance in the other close neighbors (*leucophaeus*) on Simalur and Java.

Dicrurus l. periophthalmicus strikingly illustrates the conspecific nature of the white-faced forms with those having uniform gray lores; in this form and in *leucogenis* from northern China the white areas are identical, while in the rest of its plumage *periophthalmicus* is, also absolutely, identical to a typical gray-faced form, such as *leucophaeus*. From these two races (*periophthalmicus* and *leucogenis*) in which the white area is at its greatest to those with unbroken gray faces there are all kinds of intermediate degrees, *innexus* marking the point where the white fades back into solid gray in the continental races, and *batakensis* in those of the islands.

As Ripley (1944) points out, Oberholser made no mention of Salvadori's race from Sipora in his original description of *diporus*. I agree with Ripley that the Sipora and Pagi birds are the same. The measurements, color, and facial patterns are identical. Oberholser says that the "chin and throat [are] abruptly paler than the chest." I have the type and the original series before me, and this supposed character varies a great deal. The tendency of the throat feathers to be somewhat paler is not shown by all the specimens, and in those that do show it the gradation from the throat to the upper breast is far from being abrupt. This same tendency is also shown in some Sipora specimens as well as in the one from South Pagi. I believe the make-up of the skin

has something to do with it, for this is emphasized on the skins where the throat and upper breast are fullest and most rounded.

Amusingly enough, for a population of which a pale chin is supposed to be characteristic, of seven of Oberholser's specimens, four birds had eaten some kind of food which had deeply stained their chins and throat to a varying extent with brownish black, giving these birds the appearance of having a beard. In addition to these four, the type shows under the bill and on the upper breast two medium-sized spots of this stain.

***Dicrurus leucophaeus siberu* Chasen
and Kloss**

Dicrurus leucogenis siberu CHASEN AND KLOSS, 1926, Ibis, p. 294. Siberut Island, Mentawai group.

Similar to *periophthalmicus* but slightly darker throughout, especially on the chin and throat. The white facial area is smaller, not extending so far behind the eye and over the ear coverts. Slightly smaller in all measurements.

SPECIMENS EXAMINED: Mentawai Islands, western Sumatra, Siberut Island: 3 ad. ♂, 1 subad. ♂, 1 subad. ♀.

MEASUREMENTS: Length of bill, male, 26.0–28.0 (27.33). Wing, male, 134.0–140.0 (137.66). C.T.F., male, 96.0, 100.0 (98.0). O.T.F., male, 122.0–132.5 (128.50). Depth of fork, male, 32.5–35.0 (33.75).

RANGE: Siberut Island, Mentawai group, western Sumatra.

***Dicrurus leucophaeus leucophaeus* Vieillot**

Dicrurus leucophaeus VIEILLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 587. "Ceylon" (error for Java). Based on "le Drongri," Levaillant, Oiseaux d'Afrique, 1805, vol. 4, p. 65, pl. 170.

Dicrurus leucogaster VIEILLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 587. Java. Based on "le Drongri à ventre blanc," Levaillant, Oiseaux d'Afrique, 1805, vol. 4, p. 66, pl. 171.

Edolius cineraceus HORSFIELD, 1822, Trans. Linnean Soc. London, vol. 13, p. 145. Chenta, Java.

Dicrurus ceylonensis STEPHENS, 1826, in Shaw, General zoology, Aves, vol. 13, pt. 2, p. 140. "Ceylon." Based on "le Drongri" of Levaillant.

Edolius albiventer VOIGT, 1831, Das Thierreich (Cuvier), vol. 1, p. 465. Based on "le Drongri à ventre blanc" of Levaillant.

Dicrurus cinereus SWAINSON, 1837, Natural history and classification of birds, vol. 2, p. 223. Based on "le Drongri" of Levaillant.

Buchanga wallacei WALDEN, 1870, Ann. Mag. Nat. Hist., ser. 4, vol. 5, p. 220. Lombok.

Buchanga palawanensis WHITEHEAD, 1890, Ibis, p. 47. Taguso, Palawan. (Type in A.M.N.H.)

Dicrurus leucophaeus var. *whiteheadi* DUBOIS, 1902, Synopsis avium, p. 530; new name for *Buchanga palawanensis* Whitehead.

Dicrurus cinereus celaeus OBERHOLSER, 1912, Smithsonian Misc. Coll., vol. 60, no. 7, p. 15. Simalur Island, western Sumatra. (Type in U.S.N.M.)

Dicrurus cinereus rebaptizatus HARTERT, 1919, Novitates Zool., vol. 26, p. 130; new name for *Buchanga palawanensis* Whitehead.

Closely similar to *mouhoti* and *bondi* but a shade darker than both, particularly on the throat and lower parts. Smaller than *mouhoti* and of the same size as *bondi*; the only consistent differences between *bondi* and *leucophaeus* is that in the latter the frontal band is distinctly darker and the bill is more robust and very slightly longer. Also closely related to *batakensis* but slightly darker and larger, particularly the tail, and with lores solidly gray with never a trace of white.

SPECIMENS EXAMINED: Western Sumatran islands, Simalur: no locality, 1 ad. ♂ (the type of *D. c. celaeus*), 2 ad. ♂, 2 ad. ♀; Sibabo Bay, 2 ad. ♂, 1 ad. ♀; west coast, 1 ad. ♂; all the specimens are the original series.

Java: Mt. Gedeh, western Java, 2 unsexed ad., 2 unsexed imm.; Cheribon, 1 ad. ♀; Mt. Ardjuno, eastern Java, 6 ad. ♂, 1 imm. ♂, 5 ad. ♀; Tosari, 1 ad. ♂, 1 ad. ♀; Java, no locality, 1 ad. ♂.

Bali: Danan Braban, 2 imm. ♂, 1 ad. ♀; Pik Boeldeng, 1 imm. ♂; "low country Bali," 2 ad. ♀.

Lombok: 5 ad. ♂, 1 imm. ♂, 2 ad. ♀.

Palawan: Taguso, 1 ad. ♂ (the type of *B. palawanensis*), 2 ad. ♂, 1 imm. ♂, 1 ad. ♀ (the paratypes of *B. palawanensis*); Puerto Princesa, 1 ad. ♂, 1 mm. ♂, 2 ad. ♀, 1 imm. ♀; Iwahig, 1 ad. ♂; Brooke's Point, 1 ad. ♂, 1 ad. ♀. Balabac Island, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 24.0–28.0 (26.33); female, 24.0–28.0 (26.65). Wing, male, 126.0–142.0 (133.82); female, 122.0–136.0 (129.15). C.T.F., male, 90.0–101.5 (95.50); female, 91.0–103.0 (96.72). O.T.F., male, 122.0–136.0 (129.79); female, 121.0–

134.0 (126.39). Depth of fork, male, 28.5–41.0 (34.45); female, 24.0–34.0 (29.10).

The measurements of the individual populations are:

Wing: Simalur, male, 132, 134.5, 135, 136, 137, 138 (135.41); female, 128, 129, 132 (129.66); Java, male, 128.5, 129, 129, 130, 134, 137, 137 up to 3000 feet altitude, 140 at 10,000 feet (133.06); female, 125, 126, 126, 127, 130, 132, 133 (128.43); Bali, female, 130.5, 131, 132 (131.50); Lombok, male, 135, 136.5, 136.5, 140, 142 (138.0); female, 133, 136 (134.5); Palawan, male, 126, 126, 127.5, 132, 132, 135 (129.75); female, 122, 125, 126, 130 (125.75); Balabac, female, 130.

Bill: Simalur, male, 26.5, 27, 27.3, 27.5, 28, 28 (27.41); female, 27, 27, 27.5 (27.16); Java, male, 24.5, 25, 26, 26, 26, 26, 26.5 (25.75); female, 24, 25.5, 26, 26.5, 27, 27, 27 (26.15); Bali, female, 27.5, 28 (27.75); Lombok, male, 26, 27, 27, 27.5, 28 (27.10); female, 27, 27.5 (27.25); Palawan, male, 24, 25, 25.5, 26, 26.5, 27 (25.67); female, 25, 27, 27, 27 (26.50); Balabac, female, 26.

O.T.F.: Simalur, male, 127.5, 131, 132, 133, 135 (131.70); female, 125, 128, 134 (129.0); Java, male, 125, 126, 128, 130, 130, 131, 134, 136 (130.0); female, 122, 125, 127, 128, 128.5, 129, 130 (127.08); Bali, female, 127, 129 (128.0); Lombok, male, 128, 128, 129, 136, 138 (131.80); female, 125, 128 (126.50); Palawan, male, 122, 122.5, 124, 127, 129, 133 (126.25); female, 121, 121, 122, 129 (123.25); Balabac, female, 123.

RANGE: Simalur, Java, Bali, Lombok, Palawan, and Balabac Islands.

DISCUSSION: Levaillant (*loc. cit.*) states that he received directly from Ceylon 13 specimens of the bird that he calls "le Drongri," while two other specimens, which he says are exactly similar except for all white underparts, were given to him by Temminck who had received them from Batavia. These latter he calls "le Drongri à ventre blanc." Vieillot retains these places of origin and calls the bird of Ceylon *leucophaeus* and the Javan bird *leucogaster*.

Tweeddale (1878, p. 75), thinking that no Ashy Drongos were found in Ceylon, investigated the possible origin of Levaillant's and Vieillot's birds. The type of "le Drongri à ventre blanc" (= *leucogaster*) was fortunately still available in the Leiden Museum, but at

the judicious application of a little heat the entire white front came off. Tweeddale says that the white skin "appeared to have been taken from the under surface of *Coccyzus jacobinus*, and, after having been fitted, to have been glued on to the plucked chin, throat, breast, and abdominal skin of *D. leucophaeus*."

Since this doctored specimen is described by both Levaillant and Vieillot as being exactly similar, except for the white underparts, to "le Drongri" (= *leucophaeus*), and the plates do show the coloring of the upperparts to be the same, there seems to be no doubt that Tweeddale is right in thinking that Vieillot's name, *leucophaeus*, applies to the Javan bird.

We know now that a race of Ashy Drongo migrates to Ceylon, but this form (*longicaudatus*) is very dark, slate blue, not pale blue gray. Levaillant's plates show no sign of fading, and these, as well as those of other drongos, even though somewhat naive, are correct on the whole as to color and form. The plate (170) of "le Drongri" (= *leucophaeus*), however, does not show the correct shape of the tail as it exists in the Javan form. Instead, the representation is that of the tail of *longicaudatus*, somewhat shorter but with its deep fork and the gradation of the rectrices, and if it were not for the light bluish gray color, plate 170 would actually be a good representation of the form that reaches Ceylon.

The matter can then never be settled. Had Tweeddale known that a race of Ashy Drongo reaches Ceylon, he would perhaps have considered the shape of the tail as well as the color. Guided, however, by Levaillant's insistence on the exact similarity of form and color and Vieillot's statement that he was not sure whether the two were distinct, he was right in showing that "le Drongri à ventre blanc" (= *leucogaster*) (pl. 171) from Java was only a doctored specimen of "le Drongri" (= *leucophaeus*) (pl. 170).

Nothing could be gained at this date by changing a well-known name that has long been in use, and Vieillot's *leucophaeus* (1817) should be maintained for the form that inhabits Java. Horsfield's *cineraceus* (1822) is then superseded, as well as Stephen's *ceylonensis* (1826), Voigt's *albiventer* (1831), and

Swainson's *cinereus* (1837), *ceylonensis* and *cinereus* being only renamings of "le Drongri," and *albiventer* of "le Drongri à ventre blanc."

On northern Sumatra, Simalur, Java, Bali, Lombok, and Palawan is found a pale blue gray drongo which varies slightly locally as to paleness. There are also small local variations in measurements, but with one exception the overlapping is virtually complete. If all these birds had been collected on a continent without any well-marked separating feature, there is no doubt that they would all be considered to belong to but one form. As it is, they are of course well, and in some cases widely, separated geographically.

They have received the following names: *batakensis* in northern Sumatra, *celaenus* in Simalur, *leucophaeus* in Java and Bali, *wallacei* in Lombok, and *whiteheadi* in Palawan.

The situation is very perplexing, for if each one of these forms is compared with any one other, small differences are seen, but if this same form is compared with all the others, these differences disappear. For instance, if *celaenus* is compared with *leucophaeus* it is seen to be slightly darker, but on the other hand it is identical in color to *wallacei* and *whiteheadi*. Its bill is slightly longer also than that of *leucophaeus* but the same as that of *wallacei*. This similarity has already received the attention of one author, Ripley (1944), who made *celaenus* synonymous with *leucophaeus*, for he could not agree that the two differed in color, and there is no distinct difference in size. Had this author's work also included the other forms, he probably would also have had to unite them.

I have plotted the ratios between the wing and bill, wing and tail, and wing and fork, and I find that, with still the one exception, they are hopelessly inextricable. No clear-cut separation can be obtained. In one ratio one form will separate from the other, but in another ratio it will become tangled with it as well as to the others.

Depths of shades being subjective, they are hard to plot. Although there seems to be, in a case or two, a very slight difference when one form is put beside another, this difference utterly disappears when all the forms are mixed and compared as one series.

When color, measurements, and the plotted

ratios are compared, the only tendency visible is that *wallacei* tends to be largest and *whiteheadi* smallest, but the tendency is only a tendency and the overlapping with all the others is still so great that I cannot pull the forms apart. These two forms could perhaps be separated from each other, but since I cannot separate *wallacei* from *celaenus*, *whiteheadi* from *leucophaeus*, or *celaenus* from *leucophaeus*, I think it will be more constructive to lump together all four, that is, since *leucophaeus* is the older name, to make *wallacei*, *celaenus*, and *whiteheadi* synonyms of it.

My one exception is *batakensis*. This form from northern Sumatra occasionally shows a hint of white on the lores, whereas none of the other four ever do. Its tail length is also distinctly shorter, measuring from 113.0 to 126.0 (120.0), whereas in Simalur (*celaenus*) it is 127.5 to 135.0 (131.70), in Java and Bali (*leucophaeus*) 125.0 to 136.0 (130.0), in

decreases in size from north to south. The individual measurements of all my adult specimens are as follows:

Northern India (southern Punjab, Nepal, and northern United Provinces): Wing, male, 127, 131, 135; female, 124, 125, 125, 130. O.T.F., male, 123, 132; female, 120, 122, 127, 130. Bill, male, 25, 25, 26; female, 24.5, 25, 25, 26.

Central India (Bhopal, and northern Central Provinces): Wing, male, 120, 124, 134. O.T.F., male, 110, 115, 129. Bill, male, 24.5, 26, 27.

Southern India (southern Bombay Presidency, and Madras): Wing, male, 125, 129; female, 119.5, 120, 121, 121, 121.5, 122, 123. O.T.F., male, 115, 122; female, 111, 113, 117.5, 118, 118, 120. Bill, male, 24.5, 25; female, 23.2, 23.8, 24, 24, 24.5, 25, 26, 26.

The range of variation and averages of the above populations (both sexes combined) are:

Northern India (north of latitude 20° N.)			
Wing	10 specimens	120.0–135.0	(127.50)
O.T.F.	9 specimens	110.0–132.0	(123.00)
Bill	10 specimens	24.5–27.0	(25.40)
Southern India (south of latitude 20° N.)			
Wing	9 specimens	119.5–129.0	(122.44)
O.T.F.	8 specimens	111.0–122.0	(116.80)
Bill	10 specimens	23.2–26.0	(24.63)

Lombok (*wallacei*) 128.0 to 138.0 (131.80), and in Palawan (*whiteheadi*) 122.0 to 133.0 (126.25). It can be seen that in the case of *batakensis* there is virtually no overlap, whereas the other four either overlap completely with one another or a great deal in the case of *whiteheadi*.

On the plotted ratios, *batakensis* also separates in every case from the birds of Simalur and Lombok, and one time out of three from those of Java and Palawan.

DICRURUS CAERULESCENS WHITE-BELLIED DRONGO

The range of the White-bellied Drongo is limited to India and Ceylon; in India it extends from the lower slopes (6000 feet) of the Himalayas to the extreme south and, according to Baker (1924), from Kutch in the west to western Bengal and Behar in the east. Like all the other drongos whose range extends over the whole of India, *caerulescens*

These measurements show that the birds of northern India are a little larger throughout than those of southern India, but the overlap in the individual measurements is about 50 per cent in the length of the wing and tail and more in that of the bill. A larger series made up of breeding birds would probably show that this decrease follows a cline with no step sharp enough to constitute a dimensional race.

This decrease, according to Baker (1924), is accompanied to a certain extent by a similar reduction in the amount of white over the abdomen. In this respect, my specimens show a good deal of individual variation but no discernible geographical variation.

In Ceylon, however, the birds have diverged enough to constitute two easily recognizable races, *insularis* in the north and southeast and *leucopygialis* in the southwest. This separation appears to be ecological and has apparently been caused by adaptation to

a climatic contrast, in this case rainfall.

There are three distinct climatic zones in Ceylon with very divergent conditions of temperature and humidity which have greatly affected the fauna and flora. In the introduction to the "Avifaunal survey of Ceylon," Whistler (1944) quotes Phillips' definition of these zones (1929).

In the first of these zones, the "*Low-country Dry Zone*," which includes the northern half of the island, the eastern, and the eastern half of the southern province as far as Matara, the land is flat and receives an annual rainfall of 60 inches, most of which falls during the northeast monsoon. In this zone is found *insularis*. Phillips (1929, p. 120) states that in this zone "the general fauna is closely akin to, and in many cases identical with, the fauna of the neighbouring coasts of the Indian mainland." This is borne out by *insularis* which, of the two Ceylon forms, is the closest to the Indian form.

In the second zone, the "*Low-country Wet Zone*," which lies to the southwest of the central mountains, the land is broken and consists of low hills and receives a well-distributed annual rainfall to 200 inches. In this zone is found the darker *leucopygialis*.

The third zone, the "*Central Hill Zone*," consists of the central mountains with altitudes reaching to between 7000 and 8000 feet and receiving an annual rainfall of over 200 inches in some parts but considerably less in others. Neither *leucopygialis* nor *insularis* is regularly found in this zone, but according to Whistler (1944) the latter may go up to 4000 feet, and probably both of the forms extend, at least part way, up the slopes.

On the borders of the range the two races grade into each other. Legge (1879) describes in detail several intermediate specimens from the region of Chilaw north of Colombo, and from the district of Kandy in the center, and the district of Uva in the east. Occasionally dry zone birds (*insularis*) may be found part way into the wet zone (*leucopygialis*), or vice versa. The Chilaw specimen of Legge is now in the collection of the American Museum and rather than being "intermediate" appears to me to be "typical" of *leucopygialis*, though Chilaw is in the open and dry zone. Ripley (1946) has collected a specimen of *insularis* at Rakwana in the southwest in the

area of heavy rainfall. The two forms may eventually swamp each other, for the faunal barriers are fast breaking down owing to the cutting and burning of the forest and the resulting drying up.

The two Ceylon races are similar in size, and are a little smaller than the Indian *caerulescens*, particularly when compared to specimens from northern India. As Whistler remarks (1944), the bill in the Ceylon races is a little heavier than in the birds from southern India. It is also slightly longer; seven specimens of both sexes of the two races from Ceylon measure 24.0 to 26.0 (25.21) as against 23.2 to 26.0 (24.63) in 10 specimens from southern India. However, this difference disappears when the birds of Ceylon are compared to those of northern India in which 10 specimens measure 24.5 to 27.0 (25.40); in these latter the bill is just as robust and, if anything, slightly heavier.

The Indian race (*caerulescens*) is the palest and shows the maximum amount of white, the white area extending from the lower breast down and spreading over the flanks. Both of the Ceylon races are darker and show less white; *leucopygialis* is the darkest, and the only pure white area is confined to the under tail coverts, *insularis* is intermediate both as regards color and extent of the white area.

The species (*caerulescens*) can be described as follows:

GENERAL DESCRIPTION OF THE SPECIES

Frontal band and lores black, without gloss. Upperparts similar to those of *D. leucophaeus beavani*, that is, lustrous and rather dully glossed, and varying in color from dark slaty gray to indigo. Sides of the face, chin, throat, and upper breast without gloss or slightly so on the upper breast, and varying in color from smoky blue gray to blackish. The rest of the underparts white, the white area more or less streaked with smoky gray, getting purer white as it extends downward, and varying in extent from the lower breast and flanks to being largely restricted to the under tail coverts. Tail moderately long and slender, a little shorter than the wing, the fork moderate in depth, the ends of the outer rectrices curving outward.

Dicrurus caerulescens caerulescens Linnaeus

Lanius caerulescens LINNAEUS, 1758, *Systema naturae*, ed. 10, vol. 1, p. 95. Based on Edwards, 1747, *Aves*, vol. 1, pt. 2, p. 56. Bengal.

Lanius caeruleus MÜLLER, P. L. S., 1776, *Natursystem*, suppl., p. 72. India.

Lanius fmgah SHAW, 1809, *General zoology*, vol. 7, pt. 2, p. 291; new name for *L. caerulescens* of Linnaeus.

Upperparts slaty gray, lower parts smoky blue gray and without gloss; the white area starts irregularly on the lower breast and spreads onto the flanks, is generally rather sharply defined and shows little or no streakings, except for a few gray washes on the flanks.

SPECIMENS EXAMINED: Northern India: north-western Himalayas, no locality, 1 unsexed imm. Southern Punjab, 1 unsexed ad. [♂?]. Nepal, Hetora, 1 ad. ♂. Northern United Provinces, Moradabad, 1 ad. ♂; Gorakhpur, 1 imm. ♂, 1 ad. ♀; Siswa Bazar, 1 ad. ♀; Khada, 1 ad. ♂; Nichlaul, 1 ad. ♀.

Central India: Bhopal, Sanchi, 1 ad. ♂. Northern Central Provinces, Bheraghat, 2 ad. ♂. Southern Central Provinces, Chanda district, Alapalli, 1 imm. ♂.

Southern India: Southern Bombay Presidency, Londa, 1 ad. ♂, 1 imm. ♂, 6 ad. ♀, 1 imm. ♀, 1 unsexed imm.; Jagalbed, 1 ad. ♂, 2 imm. ♂. Madras Presidency: Nilgiri Hills: Coonoor, 1 imm. ♀; Kunjapanai, 1 ad. ♀; Metapollirne [Mettupalaiyam], 1 ad. ♀. Mysore, no locality, 1 unsexed ad.

India (not located): Dadupur, 1 unsexed ad.; Futtahgur, 1 imm. ♂, 2 unsexed ad.

MEASUREMENTS: Length of bill, male, 24.5–27.0 (25.40); female, 23.2–26.0 (24.75). Wing, male, 120.0–135.0 (128.10); female, 119.5–130.0 (122.90). C.T.F., male, 85.0–97.0 (91.29); female, 83.0–92.0 (88.37). O.T.F., male, 110.0–132.0 (121.0); female, 111.0–130.0 (119.65). Depth of fork, male, 25.0–37.0 (31.50); female, 26.0–33.0 (28.50).

RANGE: India, from the extreme south to the slopes of the Himalayas, and according to Baker, from Kutch in the west to western Bengal and Behar in the east.

Dicrurus caerulescens insularis Sharpe

Buchanga insularis SHARPE, 1877, *Catalogue of the birds in the British Museum*, vol. 3, p. 253. Lunugalla, southeastern Ceylon.

Similar to *caerulescens* but a little smaller and a little darker above and considerably more so below. Abdomen duskier and more streaked, the white area smaller, not extending to the flanks, and starting lower down, on the central abdomen rather than on the lower breast.

SPECIMENS EXAMINED: Ceylon, Lunugalla, 1 ad. ♂, 1 ad. ♀; no locality, but characteristic of *insularis*, 1 imm. ♂.

MEASUREMENTS: Length of bill, male, 26.0; female, 24.0. Wing, male, 125.5; female, 120.5. C.T.F., male, 86.0; female, 84.0. O.T.F., male, 114.0; female, 112.0. Depth of fork, male, 28.0; female, 28.0.

Additional measurements from Whistler (1944, p. 167) of eight adult males and four adult females: Bill, male, 24.5–26; female, 23.5–24.5. Wing, male, 119–127; female, 110.5–125. C.T.F., male, 80–91; female, 89–97. O.T.F., male, 104–117; female, 106–113.

RANGE: The low country dry zone of Ceylon. Grades into *leucopygialis*.

Dicrurus caerulescens leucopygialis Blyth

Dicrurus leucopygialis Blyth, 1846, *Jour. Asiatic Soc. Bengal*, vol. 15, p. 298. Colombo, southwestern Ceylon.

Similar to *insularis* but darker and glossier, indigo above, blackish below, the upper breast slightly glossy, unlike *insularis* and *caerulescens*. The pure white area is restricted to the under tail coverts which stand out in contrast with the rest of the abdomen which is much duskier and much more streaked than in *insularis*.

SPECIMENS EXAMINED: Ceylon, Colombo, 1 imm. ♀; Wellawatta, near Colombo, 1 ad. ♂; Kotte, near Colombo, 1 ad. ♂, 1 ad. ♀; Chilaw, 1 ad. ♂; no locality, but characteristic of *leucopygialis*, 1 ad. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 24.0–26.0 (25.37); female, 25.0. Wing, male, 120.0–121.0 (120.50); female, 118.0, 118.0. C.T.F., male, 82.5–87.0 (85.37); female, 87.0. O.T.F., male, 111.0–112.5 (111.62); female, 108.0. Depth of fork, male, 24.0–29.5 (26.25); female, 21.0.

Additional measurements from Whistler (1944, p. 167) of eight adult males and 12 adult females: Bill, male, 24.5–27; female,

23.5–27.5. Wing, male, 122–128; female, 115–128. C.T.F., male, 83.0–89.5; female, 80–92. O.T.F., male, 109–119.5; female, 105–117.5.

RANGE: The low country wet zone of Ceylon (from Colombo to somewhere between Matara and Tangalla on the southern coast, Whistler). Grades into *insularis*.

Dicrurus annectans Hodgson

CROW-BILLED DRONGO

Bhuchanga annectans HODGSON, 1836, India Rev., vol. 1, no. 8, p. 326. Nepal.

Edolius affinis BLYTH, 1842, Jour. Asiatic Soc. Bengal, vol. 11, p. 174. Malay Peninsula.

Frontal band and lores velvety black, ear coverts dull black, the rest of the plumage glossed with moderately strong metallic blue green, or greenish, except on the flanks which are silvery gray. On the top of the head, mantle, throat, and breast, the gloss is restricted to the edges and ends of the feathers, resulting in a somewhat scaly appearance. Immatures, like those of *adsimilis* and *macrocerus*, are barred below to a varying degree with whitish or buff and have small white feathers along the inner bend of the wing and white tips on the axillaries. Tail moderately forked, the outer rectrices curving outward.

SPECIMENS EXAMINED: Nepal, Hetora, 1 ad. ♂; 2 subad. ♀. Assam: Tura, 1 ad. ♂; Sadiya, 1 imm. ♂; Baldamgiri, 1 imm. ♀. Lower Burma: Kyeikpadein near Pegu Town, 1 imm. ♂; Pegu Town, 1 ad. ♀; Pegu Yomas, Kathitpingan, 1 ad. ♂; Tenasserim, Houndraw River, Kankarit, 1 imm. ♂; southern Tenasserim, no locality, 1 ad. ♂; 1 subad. ♀. Siam, no locality, 1 unsexed ad.; Bangkok, 1 ad. ♀; Tongka, 1 ad. ♂; extreme peninsular Siam, Khoa Luang, 1 ad. ♀. Straits of Malacca, Aroa Islands, Pulo Djmoer, 2 ad. ♂, 1 ad. ♀. Malacca, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀. Johore, Segamat, 1 ad. ♀. Sumatra: Deli, 4 ad. ♀; northeastern Sumatra, Tandjoeng Morawa, 1 ad. ♂, 2 ad. ♀; no locality, 3 ad. [♂?], 1 imm. ♀. Northern Borneo, Sandakan, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 28.0–31.5 (29.70); female, 28.0–30.0 (29.0). Wing, male, 140.0–150.0 (145.33); female, 137.0–147.0 (141.87). O.T.F., male, 119.0–133.5 (126.23); female, 120.0–130.0 (124.60). C.T.F., male, 99.0–107.0 (103.50); female, 100.0–112.0 (103.32). Depth of fork, male, 17.5–26.0 (22.67); female, 15.0–27.5 (21.22).

RANGE: The plains along the Himalayas and the foothills from Nepal to Assam, northern and central Burma, the Shan States (Baker), and northern Siam. Migrates through the whole of the Malay Peninsula and its neighboring islands, to Sumatra, western Java (Chasen), and northern Borneo.

DISCUSSION: The series shows but a small amount of individual variation.

Dicrurus annectans resembles *D. macrocerus* and undoubtedly was directly derived from it. The general resemblance is still fairly close, close enough to have misled an experienced worker like Kloss into describing two typical specimens of *D. macrocerus cathoecus* as a new race of *annectans*. But the resemblance is only superficial, and the supposed new race (*D. a. siamensis*) was soon withdrawn by its author. *D. macrocerus* and *D. annectans* are best distinguished from each other by their general build; *annectans* is less slender, more robust in every way, and has a larger and much heavier bill, and its tail is shorter and much less deeply forked.

However, important as these differences are from the point of view of identification, much more significant are the appearance and texture of the plumage. *D. annectans* is not highly glossed, but the gloss is no longer uniformly distributed over the upper surface of the feather and of the body as in all the preceding species, but is instead very definitely limited to the edges and ends of the feathers, particularly on the crown, breast, and upper back. This character, the restriction of the gloss to part of the feather, and to certain feathers, will undergo various modifications, but will be characteristic of all the remaining members of the family. *D. annectans* is well named; it is the connecting link between the simpler species and the more specialized ones.

The breeding ranges of *annectans* and *macrocerus* overlap, and in view of their general resemblance it would be of interest to know how their ecological requirements differ. The information is scanty, particularly in the case of *annectans*, but this species is more of a forest bird than *macrocerus*; *annectans* may occasionally breed in more or less open country, but generally it definitely prefers heavily wooded areas or the edge of the forest. *D. macrocerus* just as definitely chooses the

sites of open cultivation, roadsides, the neighborhood of human habitations, and even the interior of towns. According to Baker (1933) it is not at all particular what kind of tree it builds in or where it is found; it may be just a solitary tree in a garden or a field. This ecological preference is reflected in the habits of the two species; *annectans* is retiring—that is, for a drongo—while *macrocerus* is semi-domesticated, very bold, and ubiquitous. The altitude requirements differ, at least partially so; in northern India both breed along the Himalayas from the plains up into the foothills, but *macrocerus* goes much higher, up to 7000 feet, while *annectans* stops at 2000. My only breeding specimens of *annectans* from northern India were collected from May 18 to 28 at Hetora in Nepal at an altitude of about 1400 feet. These specimens are part of a very large collection from Nepal, and apparently the collector failed to find it elsewhere in the higher altitudes.

Dicrurus annectans is very definitely migratory, the migrants reaching Java and northern Borneo. No other drongo follows such a long route. The Chinese races of *leucophaeus* (*leucogenis* and *salangensis*) and *D. macrocerus cathoecus* go almost as far, but their migration is more direct and better known, while some of the movements of *annectans* are none too clear.

It breeds at least as far south as northern Siam (Deignan, 1945). It may breed in southern Burma; I have two adults collected on May 11 and June 8 in lower Pegu. It may even breed in Tenasserim; Smythies (1940) lists it from this region but is uncertain whether the bird is a resident there or a migrant.

Chasen (1939, p. 351) says, "This drongo is a migrant from the north, and is not known to breed in the Peninsula. During the winter months it is very common on the coasts and on the small islands in the Straits of Malacca, but it is much rarer in the inland districts."

Even more explicit is the statement of Robinson and Kloss (1924b, p. 341), "Out of the immense series of birds that have passed through our hands in the last fifteen years not one is dated between 20th April and 22nd September, while the bird is always rare in inland districts except for very brief periods in September and October and again in March. In the winter it is always common on small

islands in the Straits of Malacca. In the island of Junk Seylon, or Puket, Müller [1882, 'Die Ornithologie der Insel Salanga'] records it as remaining as late as 18th June, though it did not arrive until 18th November, while Oates says it sweeps through Pegu in October."

In view of the fact, according to Baker (1933), that in the foothills of the Himalayas most of the birds breed in April and May, a few continuing through June, June 18 seems to be abnormally late to leave for the north. If this date is correct my two specimens from Pegu could still be migrants. I also have an immature female collected on August 17 at Sandakan in northern Borneo. If the migrants come down from late September through October, this date is also abnormal. It would be much too early for a bird to arrive in Borneo; however, this immature bird may have been one that never left the winter range. As far as I have been able to find, no other evidence exists of any other *annectans* collected in Borneo during late spring or summer.

DICRURUS AENEUS BRONZE DRONGO

The range of the Bronze Drongo extends from the extreme south of India, and the slopes of the Himalayas from Mussoorie eastward through Burma, Yunnan, Siam, Indochina to the border of western Kwangsi, Hainan, and Formosa, southward through the whole of the Malay Peninsula to Sumatra and northern Borneo.

Although this range is very extensive, this drongo varies surprisingly little geographically. In his review of the species, Baker (1918) recognized but three rather poorly differentiated races. The plumage and coloration are identical, except in the case of one of the forms (*aeneus*) which has a tendency towards a grayer and less glossy rump than the other two (*malayensis* and *braunianus*). However, this character is hard to assess and is perhaps largely individual, as there is often no difference between the three races. In view of this inconstancy, and the fact that the proportions are similar, I agree with Baker that the three races can be separated from one another only on the basis of size.

The largest one is *braunianus* from Formosa; the intermediate one is *aeneus* for the

birds of Hainan and the continent to latitude 4° N. on the Malay Peninsula, at which point *aeneus* is replaced by the smaller *malayensis* which includes also the birds of Sumatra and Borneo.

The birds of southern India average smaller than typical *aeneus* from northern India, thus following the general rule for all the species of drongos whose range includes both southern and northern India. On account of this difference Baker refers the birds of southern India to *malayensis*, but my examination shows that, while the birds of the extreme tip of the Malay Peninsula, Sumatra, and Borneo differ enough from *aeneus* in measurements to constitute a true dimensional race (*malayensis*), the overlap between the birds of southern India and those of northern India is much too great (more than 50 per cent in the case of the length of the wing and more than 80 per cent in the case of the O.T.F.) to allow their separation from *aeneus*.

This conclusion was reached by Roonwal (1939, p. 295) who says that he is "unable to distinguish the two races *aenea* and *malayensis* from their plumage, and the little difference in average in wing-length given by Stuart Baker does not appear to be sufficiently significant. Birds from South India (Travancore, Mangalore, Shevaroy Hills, etc.), Bengal (Darjeeling and Calcutta), Assam (Garo Hills and Sylhet), Burma (South Irrawady, Arakan and Upper Burma) and Malacca appear to be all alike."

I agree with Roonwal, except, however, that the range of *aeneus* does not appear to extend so far south as Malacca. Chasen and Kloss (1930, p. 96) state that their specimens show that the "birds from the State of Selangor southwards in the Peninsula have a wing-range of 104–116 mm. which fairly represents a dimensional race," and that specimens from Sumatra and Borneo are identical with those from Selangor southward. I have not examined enough specimens from the southern Malay Peninsula, but the few that I have seem to show that the division between the ranges of the two races occurs at about latitude 4° N. which is just about the point indicated by Chasen and Kloss.

In his review Baker had 211 specimens. I had 126; 62 of these, formerly in the Tring Museum, were part of Baker's material; the

other 64 are fresh material, a third of which is from both southern and northern India. As my series of adult males is more representative and larger, I give their individual measurements below; for purpose of comparison the measurements of *braunianus* (Formosa) and those of *malayensis* (Malay Peninsula south of latitude 4° N., Sumatra, and Borneo) are included, the latter being taken from the literature.

Southern India: 112, 113, 116, 117, 118, 120, 120, 121, 121, 122 (118.0).

Northern India, northern Burma, northwestern Yunnan: 119, 119, 119, 119, 120, 121, 122, 122, 123, 123.5, 124, 124, 124, 124, 125, 125, 126, 126, 126, 127, 131 (123.25).

Northern Annam: 122, 122.5, 124, 124 (123.12).

Hainan: 123, 123, 123, 123.5, 123.5, 124.5, 125, 125.5, 126, 128, 130 (125.0).

Southern Burma, Siam, southern Annam, Tenasserim, and Malay Peninsula (as far south as about latitude 4° N.): 118, 121.5, 122, 122, 123, 123, 124.5, 127 (122.62).

Malay Peninsula (south of latitude 4° N.): Two unsexed adults, 110, 113; from the literature, Chasen and Kloss (1930), 104–116 (no numbers, sex, or average given).

Sumatra: From the literature, Robinson and Kloss (1924a), and Kloss (1931), all adult males: 105, 107, 108, 108, 109, 110, 110, 112, 112 (109.0).

Borneo: From the literature, Chasen and Kloss (1930), adult males: 108, 111, and 107–112 (no numbers, sex, or average given).

Formosa: 128.5, 129, 131, 131.5, 132, 132, 132.5, 133, 133.5, 135, 136 (132.18).

It can be seen that all the populations from northern India east to Hainan and south to Selangor (latitude 4° N.) are virtually identical. The birds of southern India average smaller, but their measurements greatly overlap those of the birds of northern India and not those from Selangor southward, Sumatra, and Borneo. In the case of the wing length this overlap between the southern and northern populations of India is 50 per cent. In the case of the tail length the overlap is almost complete; the O.T.F. in adult males measures, in southern India: 105, 108, 109, 109, 110, 112, 112.5, 113, 117 (110.60); in northern India: 109, 110, 111, 113, 114, 114.5, 115.5, 117, 117, 118, 118, 120, 120.5, 126

(115.67). In view of the fact that the size difference is too small to be significant (4 per cent in the case of both the wing and the tail) and the overlap is so great, I believe that the birds of southern India are not separable from typical *aeneus* of northern India.

GENERAL DESCRIPTION OF THE SPECIES

Whole plumage black, frontal band and lores velvety, ear coverts dull, the rest of the plumage, with the exception of the quills, abdomen, and flanks, covered with brilliant metallic gloss which with the play of light changes from green to purple. On the feathers of the crown, hind neck, throat, and upper breast, the gloss is limited to the tips of the feathers, giving them a pointed and scaly appearance; on the throat the glossy feathers are more separated and form spangles. Immatures much duller, browner, and grayer, and with the axillaries heavily tipped with white. In fully adult specimens these spots may persist though reduced in size and number. Tail slender, well forked, the outer rectrices flaring outward rather little.

Dicrurus aeneus aeneus Vieillot

Dicrurus aeneus VIEILLLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 586. Based on "le Drongo Bronzé," Levaillant, 1805, Oiseaux d'Afrique, vol. 4, p. 75, pl. 176. Bengal

Dicrurus aeratus STEPHENS, 1826, in Shaw, General zoology, Aves, vol. 13, pt. 2, p. 138. Based on "le Drongo Bronzé" of Levaillant.

Edolius metallicus VOIGT, 1831, Das Thierreich (Cuvier), vol. 1, p. 465. Based on "le Drongo Bronzé" of Levaillant.

Chaptia muscipetoides HODGSON, 1836, India Rev., vol. 1, no. 8, p. 327. Nepal.

Chaptia aenea kwangsiensis CHONG, 1932, Sinensia, vol. 3, no. 6, p. 167, fig. 1. Lungchow, Kwangsi. (Type in Metrop. Mus. Nat. Hist., Canton.)

Larger than *malayensis*, smaller than *braunianus*, and with a tendency for more specimens to have a grayer and less glossy rump than either.

SPECIMENS EXAMINED: Southern India: Travancore, Anjengo, 1 unsexed ad. Southwestern Madras Presidency: Calicut, 2 unsexed ad.; Nilambur, 1 ad. ♂; Nilghiri Hills, Kunjapanai, 4 ad. ♂. Southern Bombay Presidency: Londa, 4 ad. ♂, 3 ad. ♀, 1 unsexed subad.; Jagalbed, 1 ad.

♂, 1 ad. ♀. "Southern India," no locality, 1 unsexed ad.

Northern India: Nepal: Amlekhganj, 1 ad. ♂; Hetora, 1 ad. ♂, 1 subad. ♂, 2 imm. ♀; Thankot, 1 ad. ♀. Sikkim: Tista River, 2 unsexed ad.; Tista River, Domohni, 1 ad. ♀. Bengal, Sukna, near Siliguri, 1 ad. ♀; southeastern Bengal, Dacca, 2 ad. ♂. Northern Cachar: Gunjong, 2 ad. ♂, 1 ad. ♀; Laisung, 1 ad. ♂; Guilang, 1 ad. ♂; Maher, 1 ad. ♂. Assam: Tura, 1 ad. ♂, 1 imm. ♀, 1 unsexed ad.; Baldamgiri, 1 ad. ♂; Margherita, 3 ad. ♂, 3 ad. ♀, 1 unsexed ad.

Northern Burma and northwestern Yunnan: northern Burma: Lauhkaung, 1 ad. ♂, 1 ad. ♀; upper Chindwin, Dalu (=Taro), 2 ad. ♂; Nam-paseik, 1 ad. ♀. Northwestern Yunnan: Teng-yueh, 6 ad. ♂, 2 ad. ♀, 2 imm. ♀, 1 unsexed ad.

Northern Indochina: Northern Annam: Hoi Xuan, 2 ad. ♂, 1 ad. ♂ (?), 1 ad. ♀. Tonkin: Bac Khan, 1 ad. ♂. Northern Laos: Nam Kham River, Don Zua, 1 ad. ♂.

Hainan: Lei Mui Mon, 3 ad. ♂; Mt. Wuchi, 5 ad. ♂, 3 ad. ♀; Cheteriang, 2 ad. ♂, 2 ad. ♀; Nododa, 1 ad. ♂ (?), 1 ad. ♀.

Southern Burma, Siam, southern Annam, Tenasserim, and Malay Peninsula (as far south as about latitude 4° N.): Southern Burma: Thayemyo, 1 ad. ♂ (?). Siam: no locality, 1 unsexed ad. Western Siam: "60 M. S. E. of Um Pang," 1 ad. ♂; "25 M. S. W. Kempenpit," 1 unsexed ad. Southeastern Siam: Ban Si Racha, 1 ad. ♂. Southern Annam, Daban, 1 ad. ♂. Tenasserim: Thaungyeen River, 1 ad. ♂; Bilin Valley, 1 subad. ♀. Selangor-Pahang boundary, Semangkok, 3 ad. ♂, 1 subad. ♀.

MEASUREMENTS: Length of bill, male, 20.0–25.0 (23.14); female, 21.5–24.5 (23.18). Wing, male, 112.0–131.0 (122.40); female, 112.5–127.0 (120.54). C.T.F., male, 78.0–93.0 (85.91); female, 80.0–92.0 (85.84). O.T.F., male, 105.0–131.0 (115.11); female, 105.0–124.0 (114.26). Depth of fork, male, 19.0–39.0 (29.82); female, 19.0–36.0 (28.90).

RANGE: Southern and northern India (from Mussoorie eastward), Burma, Yunnan, southwestern Kwangsi (Lungchow) (Chong), Hainan, Indochina, Siam, and the Malay Peninsula as far south as Selangor to about latitude 4° N. Intergrades with *malayensis* above northern Selangor.

DISCUSSION: Chong in 1932 collected two specimens on the southwestern border of Kwangsi near Lungchow very close to the frontier with Tonkin. These two birds are described as a new form called *Chaptia aenea*

kwangsiensis which is said to differ from *aeneus* by having a grayer rump and from *malayensis* by being larger.

Upon their reexamination of these two specimens, Yen and Chong (1937) made *kwangsiensis* synonymous with *aeneus*. In the original discussion Chong said that his two birds were "autumn visitants" and were not common in Kwangsi. Since *aeneus* is regularly found in Tonkin right across the border from Lungchow, and since it often shows a tendency towards a gray and non-glossy rump and is always larger than *malayensis*, it appears that *kwangsiensis* is merely a re-naming of two wandering specimens of *aeneus*.

***Dicrurus aeneus malayensis* Blyth**

Chaptia malayensis BLYTH, 1846, Jour. Asiatic Soc. Bengal, vol. 15, p. 294; *ex* Hay MS. Malacca.

Edolius picinus BONAPARTE, 1850, Conspectus generum avium, vol. 1, p. 352; *ex* Müller MS. Sumatra.

Similar to *aeneus* but a little smaller and with a tendency to be slightly glossier, particularly over the rump.

SPECIMENS EXAMINED: Southern Malay Peninsula: Pahang, Ulu Bentong, 1 ad. ♀; Selangor, no locality, 1 unsexed ad.; Malacca, 1 unsexed ad. Sumatra: Deli, 1 subad. ♀. Borneo: Sarawak, Kuching, 1 unsexed ad., 1 unsexed imm. Northern Borneo: Sibatik Island, 1 ad. ♀.

MEASUREMENTS: Length of bill, female, 21.0, 22.5 (21.75); unsexed adults, 20.0–23.0 (22.0). Wing, female, 110.0, 112.5 (111.25); unsexed adults, 110.0–115.0 (112.50). C.T.F., female, 80.0, 80.0; unsexed adults, 79.0–85.0 (80.75). O.T.F., female, 98.0, 99.0 (98.50); unsexed adults, 97.0–111.0 (103.0). Depth of fork, female, 18.0, 19.0 (18.50); unsexed adults, 18.0–31.0 (22.66).

Additional measurements from the literature: Sumatra, Kloss (1931, p. 359), and Robinson and Kloss (1924a, p. 322): Wing, nine adult males, 105.0–112.0 (109.0); six adult females, 109.0–115.0 (111.66); Chasen and Kloss (1930, p. 96), 15 adults of both sexes, 105.0–112.0. Malay Peninsula from Selangor southward, Chasen and Kloss (*ibid.*): Wing, adults of both sexes, 104.0–116.0. Borneo, Chasen and Kloss (*ibid.*): Wing, male, 108.0, 111.0 O.T.F., male,

90.0, 100.0. Wing, adults of both sexes, 107.0–112.0.

RANGE: Southern tip of the Malay Peninsula from Selangor southwards or from about latitude 4° N., Sumatra, and Borneo.

DISCUSSION: Robinson and Kloss (1924a) called the birds of Sumatra *picinus*, but after studying further material, Chasen and Kloss (1930) said that the former authors had been in error when they recognized a Sumatran race. They show by measurements that the birds of Borneo and Sumatra are identical with those of *malayensis* from the southern Malay Peninsula from Selangor southwards.

***Dicrurus aeneus braunianus* Swinhoe**

Chaptia brauniana SWINHOE, 1863, Ibis, p. 269. Interior mountains of Formosa.

Similar to *aeneus* but a little larger.

SPECIMENS EXAMINED: Formosa: Kodensho, 6 ad. ♂, 4 ad. ♀; Tapposha, 2 ad. ♂, 3 ad. ♀; no locality, 2 ad. ♂, 1 ad. ♂(?), 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 22.0–26.0 (23.86); female, 22.0–24.0 (23.0). Wing, male, 128.5–136.0 (132.18); female, 127.0–132.0 (129.88). C.T.F., male, 89.0–98.0 (92.04); female, 90.0–96.0 (92.75). O.T.F., male, 117.0–130.0 (124.0); female, 117.0–126.0 (122.21). Depth of fork, male, 26.5–40.0 (32.0); female, 25.0–31.5 (29.0).

RANGE: Formosa.

DICRURUS REMIFER

LESSER RACKET-TAILED DRONGO

The range of the Lesser Racket-tailed Drongo extends throughout the lower Himalayas eastward from Kumaon (Baker) to Yunnan and southwestern Kwangsi, southward (except in the southern plains) through Burma, Indochina, and Siam, down the Malay Peninsula as far as southern Selangor and southern Pahang, to Sumatra and Java. On the continent and on Sumatra this range coincides with that of *Dicrurus aeneus*; both are forest birds, but *remifer* is more strictly a bird of the foothills and lower mountains and of the denser woods where it breeds in small clearings or alongside streams.

Like all the other species of drongos that have the Himalayas for the northern limit of their range, it decreases in size from north to south, but the diminution is not so well

marked as in the other species. There is so much overlapping that, as in the case of *aeneus*, it is only at the extremes of the range that the size difference is at all well marked.

There are no color or structural differences except for the racket, but this character varies geographically and allows a clear-cut separation into four easily recognizable races.

The most northern race, *tectirostris*, has broader rackets starting abruptly from the shaft; the most southern race, *remifer* (Sumatra and Java), has narrower and more elongated rackets, the webs of which taper onto the shaft for a short distance. In *peracensis* (Malay Peninsula), the tendency of the webs to spring gradually from the shaft is very much accentuated, and the racket becomes very long and attenuated as well as narrower. In *lefoli* (southern Cambodia), this is carried to an even greater extreme, the webs then occupying three-quarters of the length of the shaft, and the racket is a racket no longer, but rather a long narrow streamer.

This transformation of the racket has led Riley (1938) into the erroneous opinion that the birds with attenuated rackets (*peracensis* and *lefoli*) were specifically distinct from those in which the racket is broader and more abrupt (*tectirostris* and *remifer*). Actually, specimens from Java and Sumatra (*remifer*) can be found in which the racket tapers almost as much as in typical *peracensis*. *D. r. peracensis* and *tectirostris* also intergrade into each other, such intergrades having rackets indistinguishable from those of *remifer*. Furthermore, the four races occupy distinct ranges, replace one another geographically, and intergrade whenever they come into contact.

The series includes specimens from the nestling through to the adult stage. It shows, as was correctly stated by Oates (1889), that the lengthened bare shafts and rackets are only acquired at the second autumnal moult. It also shows that it takes three years to assume the adult plumage. As the succession of plumages in *D. remifer* is the most striking of that of any drongo, it is briefly described as follows:

A. FIRST ANNUAL PLUMAGE: The gloss is much restricted, and is absent below, except for a few small spangles on the throat and a band across the upper breast. The axillaries

are broadly tipped with white. The tail is made up of fully webbed feathers and is slightly forked.

B. SECOND ANNUAL PLUMAGE: Attained in the fall of the succeeding year. The birds are much glossier above. Below, the gloss extends farther down. The quills are brownish, the outer primary being longer, wider, and more rounded than in the adult, and the whole wing is shorter. The white axillary spots are still numerous but are becoming smaller. The frontal "brush" begins to develop. The shaft of the outer pair of rectrices is elongated and denuded and bears terminal rackets. This is the plumage of the subadults and will be retained for a full year until the third fall.

C. THIRD ANNUAL PLUMAGE: The bird is now in fully adult plumage. The gloss is extremely brilliant, the development of the glossy parts of the feathers being at its maximum. The silky, silvery gray feathers are more restricted to the flanks, the rest of the under plumage being black with a few glossy threads. The quills are black, the outer primary being shorter, narrower, and more pointed. The white axillary tips are much fewer and much smaller or have disappeared altogether or almost so. The frontal "brush" is fully developed. The shaft is longer, and, in *tectirostris* especially, as smooth as a wire, a slight serration persisting in some *remifer*, and traces of barbs in *peracensis* and probably also in *lefoli*.

Since *D. remifer* is largely a mountain bird, the altitudes at which my specimens were collected are indicated whenever supplied by the collector.

GENERAL DESCRIPTION OF THE SPECIES

Whole plumage black, and, with exceptions described below, covered with very brilliant metallic gloss which with the play of light changes from green to purple. On the feathers of the crown, hind neck, throat, and upper breast, the gloss is limited to the tips of the feathers, forming spangles when these feathers are separated, or, when they are closer to one another, as on the crown, breast, and upper back, giving a scaly appearance. Quills black, without gloss, except for a slight amount on the edge of the outer web and on the top of the two central tail feathers. Lower

abdomen without gloss except for a few occasional threads. Feathers of the flank without gloss, silky in texture and silvery gray.

Cheeks, lores, and frontal feathers without gloss, velvety black. There is no true crest, but the frontal feathers are very dense and brush-like and come forward to cover the greater part of the length of the bill (fig. 8).

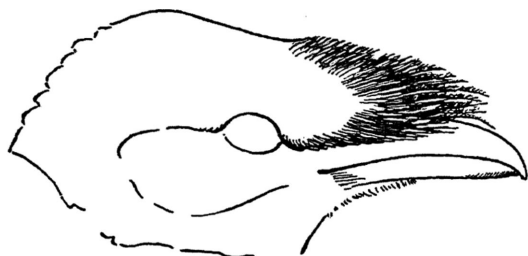


FIG. 8. Head of *Dicrurus remifer*.

Tail square, the shaft of the outermost pair of rectrices becoming completely denuded at about the level of the penultimate pair, and continues, wire-like, for a greater or lesser distance, until the barbs gradually or abruptly reappear on both sides, forming a long, more or less attenuated, ribbon-like streamer, or a flat, terminal, symmetrically webbed, paddle-like spatula, or "racket." Total length of the feather varies from about 350 to well over 500.

Immatures lack both the frontal brush and rackets, the tail being normally shaped and slightly forked. Other differences were given above in detail.

Dicrurus remifer tectirostris Hodgson

Bhringa tectirostris HODGSON, 1836, India Rev., vol. 1, p. 325. Nepal.

Bhringa remifer latispatula DE SCHAUENSEE, 1929, Proc. Acad. Nat. Sci. Philadelphia, vol. 81, p. 475. Doi Suthep, Chiangmai, northern Siam. (Type in Acad. Nat. Sci. Philadelphia.)

Bhringa fangi CHONG, 1932, Sinensia, vol. 3, no. 6, p. 171, fig. 2. Tung-Kwei of Lungchow, southwestern Kwangsi. (Type in Metrop. Mus. Nat. Hist., Canton.)

Denuded wire-like shaft very long, ending in flat, paddle-like racket, the webs of which appear abruptly onto the shaft.

SPECIMENS EXAMINED: India: Nepal, Bhimpedi, 2 ad. ♂, 2 ad. ♀, 1 unsexed nestling; Deovali, 3 ad. ♂, 2 ad. ♀, 1 subad. ♀, 1 imm. ♀. Sikkim:

no locality, 1 ad. ♂ [?], 2 unsexed subad. Northern Bengal: Darjeeling, 1 ad. ♂ [?]. Northern Cachar Luisung, 2 ad. ♂; Numpum, 1 subad. ♂; Guiland, 1 ad. ♂. Assam: Tura, 1 ad. ♂, 1 ad. ♀; Margherita, 2 imm. ♂, 3 imm. ♀.

Northwestern Yunnan: Tengyueh, "7000 feet," 1 imm. ♀. Burma: northern Burma: Nanyaseik, 1 subad. ♀; Mansum, 1 ad. ♂; upper Chindwin, Dagaungka, 1 ad. ♀. Lower Chin Hills, Mt. Victoria, 1 ad. ♂. Southern Burma, Thandaung, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀. Northern Tenasserim: north of Lampha, 1 subad. ♂; Lakya, 2 imm. ♂; Muleyit, 1 ad. ♂.

Northern Siam: Doi Khun Tan, "3-4300 feet," 3 ad. ♂, 3 ad. ♀; Doi Langka (Pang Mae Ton), 1 ad. ♂, 1 imm. ♂, 1 subad. ♀, 1 nestling ♀; Doi Pu Kha, 2 ad. ♀; Doi Hua Mot, 3 imm. ♀; Doi Me Chan, 1 ad. ♂; Sobpung, 1 imm. ♀. Northern Laos: "60 Km ENE Phong Saly," 1 subad. ♀; Nam Kham River, Don Qua, 1 ad. ♂. Northern Annam, Hoi Xuan, 1 ad. ♀, 2 imm. ♀.

MEASUREMENTS: Length of bill, male, 25.0-30.0 (27.08); female, 24.0-28.0 (26.43). Wing, male, 137.0-149.0 (141.37); female, 133.0-146.0 (138.30). C.T.F., male, 117.0-129.0 (121.81); female, 116.0-126.0 (121.64). O.T.F., male, 402.0-532.0 (463.90); female, 354.0-466.0 (390.0). Bare shaft, male, 182.0-306.0 (240.0); female, 137.0-241.0 (190.0). Length of racket, male, 81.0-120.0 (99.20); female, 82.0-113.0 (94.91). Width of racket, male, 21.0-30.0 (23.47); female, 22.0-27.0 (23.0).

RANGE: Along the lower Himalayas "between 1500 and 6000 feet" (Baker) from Kumaon (Baker) eastward through Assam, northern Burma, and Yunnan to southwestern Kwangsi, southward through Cachar, Lushai Hills, and Chittagong Hill Tracts (Baker), the whole of Burma (except the plains of the south), northern Tenasserim (to about latitude 16° N.), northern Siam, Tonkin, northern Laos, northern Annam, and central Annam (as far south as Hué) (Delacour). Intergrades with *peracensis* in south central Annam, at the Bolovens Plateau in southern Laos, and, probably, in western Siam, south of the northern plateau at Ban Rahaeng (Chasen and Kloss).

DISCUSSION: De Schauensee (*loc. cit.*) separated the birds of northern Siam as a new form (*latispatula*), supposed to differ from *tectirostris* by having a much longer tail (435, 484, 504), a broader (20, 26, 27½) and longer

(103, 103) racket. Mayr (1938a) has shown that such is not the case, and that de Schauensee had been misled into proposing his new form by Baker's incorrect measurements, as given in the "Fauna of British India" (1924).

In my series of adult males, the tail (O.T.F.) in specimens from northern India (six), northern Cachar (three), and northern Burma (one) measures; 402, 421, 438, 447, 453, 458, 486, 488, 492, 498 (458.30); in four from northern Siam, and one each from lower Burma (Thandaung), and the Kham River in north central Laos: 432, 440, 451, 486, 500, 507 (469.30). The same specimens measure for the length of the racket: India, etc., 81.0–120.0 (99.45); northern Siam, etc., 87.0–111.0 (99.40). For the width of the racket: India, etc., 21.0–30.0 (23.70); northern Siam, etc., 22.0–26.0 (23.50).

It can be seen that the measurements of the tail and its racket in the birds from northern Siam and from neighboring localities at the same latitude are (except for a slight difference in average) virtually identical to those of the birds of northern India, Cachar, and northern Burma.

Bhringa fangi is based on a lone specimen collected at Lungchow, just over the border from Tonkin. It was proposed as a new species which was said to differ in having the inner web of the racket broader and longer than the outer. After examining the type, Yen and Chong (1937) stated that the description was erroneous, and that the type and only specimen of *B. fangi* was a specimen of *tectirostris* in which both sides of the racket are exactly the same, a few barbs of the outer web merely showing a little wear.

Dicrurus remifer remifer Temminck

Edolius remifer TEMMINCK, 1823, Nouveau recueil de planches coloriées d'oiseaux, livr. 30, vol. 3, text of pl. 178, Java.

Bhringa remifer sumatrana HACHISUKA, 1926, Bull. Brit. Ornith. Club, vol. 47, p. 57. Sungei Kumbang, Korinchi, southwestern Sumatra. (Type in British Mus.)

Similar to *tectirostris* but smaller in all measurements except that of the rackets, which are slightly longer and considerably narrower. The proximal end of the racket more tapered, the webs not appearing onto the shaft as abruptly as they do in *tectirostris*.

SPECIMENS EXAMINED: Sumatra: northeastern

Sumatra, Deli: Bandar Baroe, 3 ad. ♂, 4 ad. ♀, 1 imm. ♀; Tengkeh, 1 imm. ♂, 1 ad. ♀. Southwestern Sumatra, Kerintji: Siolah Dras, "3000 feet," 1 ad. ♂, 1 ad. ♀ [?], 1 imm. ♀; Sungei Kumbang, "4500 feet," 1 ad. ♂, 1 imm. ♀.

Java: Buitenzorg, 1 ad. ♀; Mt. Salak, "3000 feet," 1 ad. ♂, 1 nestling ♂; Mt. Gedeh, Tjibodas, "4500 feet," 2 ad. ♂, 1 imm. ♂, 2 ad. ♀; Mt. Gedeh, Tjiburum, "6400 feet," 1 ad. ♂, 1 ad. ♀; Mt. Gedeh, "3–5000 feet," 2 imm. ♂, 1 ad. ♀, 1 imm. ♀, 1 unsexed ad., 1 unsexed imm.; Mt. Goentoer, 3 ad. ♂ [?], 1 ad. ♀ [?], 2 unsexed ad.; Mt. Tjareme, "2000 meters," 1 ad. ♀; Mt. Smalarie, 1 ad. ♂; Rakahak, 1 ad. ♂.

MEASUREMENTS: Length of bill, male, 23.0–26.0 (25.53); female, 24.5–26.5 (25.50). Wing, male, 129.0–139.0 (133.68); female, 124.5–137.0 (129.55). C.T.F., male, 104.0–116.0 (108.30); female, 102.0–117.0 (108.25). O.T.F., male, 392.0–453.0 (429.75); female, 324.0–382.0 (342.60). Bare shaft, male, 150.0–246.0 (205.71); female, 115.0–152.0 (128.40). Length of racket, male, 94.0–122.0 (102.70); female, 86.0–120.0 (102.0). Width of racket, male, 18.0–21.0 (19.25); female, 15.0–19.0 (17.69).

RANGE: Java and Sumatra.

DISCUSSION: Kloss (1931) states that the birds of Sumatra, separated by Hachisuka as *sumatrana* on the grounds of their being smaller than those of Java, are as a matter of fact exactly similar in both islands. As the measurements of my Sumatran specimens agree with those of Kloss, as well as with others given by Robinson and Kloss (1924a), and as furthermore they completely overlap those of a series from Java, I fully agree that *sumatrana* is only a synonym of *remifer*.

Dicrurus remifer peracensis Baker

Bhringa remifer peracensis BAKER, 1918 (November), Bull. Brit. Ornith. Club, vol. 39, p. 18. Telom, Perak-Pahang border, Malay Peninsula. (Type in British Mus.)

Bhringa remifer attenuata ROBINSON AND KLOSS, 1918 (December), Jour. Federated Malay States Mus., vol. 8, pt. 2, p. 235. Butik Fraser, Selangor-Pahang boundary. (Type formerly in Raffles Museum, Singapore, now presumably lost.)

Similar to *remifer* but with the racket still narrower, very much longer, and with a greatly attenuated proximal end. The webs, instead of starting from the shaft more or less abruptly, increase very gradually in

width over a rather long distance, the gently broadening racket appearing more like a narrow, tapered ribbon than a paddle.

SPECIMENS EXAMINED: Southern Laos: Bolovens Plateau, 1 ad. ♂. Southern Annam: Langbian Peaks, "2160 meters," 2 ad. ♂, 1 imm. ♂, 1 ad. ♀; Dalat Forest, "4500-5000 feet," 2 ad. ♂, 3 ad. ♀; Cam-ly Forest (west of Dalat), "4900 feet," 1 ad. ♂; Djiring, 1 ad. ♂; Dran, "3000 feet," 1 ad. ♀, 1 imm. ♀, 1 unsexed imm. Southeastern Siam: Khao Sabap, "1500 feet," (near Chanthaburi), 2 ad. ♀; Klong Menao, 1 subad. ♀. Peninsular Siam: Huey Ya Pla, "2500 feet," (near Bandon), 1 imm. ♂. Perak: Maxwell's Hill, Taiping, "3500 feet," 1 ad. ♂, 1 subad. ♀; Telom, "3500-3800 feet," Perak-Pahang border, 1 ad. ♂, 2 ad. ♀. Pahang: Gunong Tahan, "5-7000 feet," 3 ad. ♂, 1 subad. ♂. Selangor: Gunong Mengkwang Legah, 1 unsexed ad.

MEASUREMENTS: Length of bill, male, 25.0-28.0 (26.30); female, 24.0-27.0 (25.65). Wing, male, 130.0-141.0 (135.0); female, 125.0-136.5 (131.95). C.T.F., male, 105.0-121.0 (114.0); female, 110.0-125.0 (116.0) O.T.F., male, 374.0-514.0 (468.88); female, 379.0-460.0 (402.0). Bare shaft, male, 105.0-268.0 (171.72); female, 110.0-176.0 (125.34). Length of racket, male, 154.0-228.0 (180.0); female, 145.0-210.0 (166.0). Width of racket, male, 14.0-20.0 (16.25); female, 13.0-18.0 (15.91).

RANGE: Southern Annam, southeastern Siam, the mountains of western Siam south of the northern plateau, from about Ban Rahaeng (Chasen and Kloss), and northern Tenasserim (south of latitude 16° N.), down the length of the Malay Peninsula to southern Selangor and southern Pahang. Intergrades with *tectirostris* at the Bolovens Plateau in southern Laos, and probably in south central Annam, as well as western Siam in the region of Ban Rahaeng. Intergrades with *lefoli* in southeastern Siam at the northern end of the Cardamomes Range on the Siamese-Cambodian border.

DISCUSSION: Delacour (1932), reporting on birds collected by him on the Bolovens Plateau in southern Laos, remarks that his specimens differ from those of the Langbian region of southern Annam (*peracensis*) and from those of the Bokor region of southern Cambodia (*lefoli*) and that in size and form of the racket the Bolovens birds are identical with those of Java (*remifer*).

I have only one specimen from the Bolovens Plateau, an adult male. Its racket, while very much closer to the size and shape of that of *peracensis*, begins to depart from it. It is a little shorter and less attenuated than the typical racket of *peracensis* and approaches the rackets of some of my *remifer* specimens from Java. Its wing length is typical of that of *remifer* and *peracensis* (that is, shorter than *tectirostris*), but its bill is a full 2 mm. longer than that of *remifer*, but does fit within the range of variation of that of *peracensis* and *tectirostris*. This specimen, therefore, is not true *remifer* but appears to be an intermediate between *peracensis* and *tectirostris*.

This specimen, and the geographical position of the Bolovens Plateau (intermediate between Hué where typical *tectirostris* occurs and southern Annam for typical *peracensis*), show that in this region the two forms meet and intergrade. As a result, birds will be found showing all degrees of intermediacy, and some, apparently, like the specimens of Delacour, are indistinguishable from *remifer*.

***Dicrurus remifer lefoli* Delacour and Jabouille**

Bhringa remifer lefoli DELACOUR AND JABOUILLE, 1928, Bull. Brit. Ornith. Club, vol. 48, p. 133. Bokor, southern Cambodia. (Type in Paris Mus.)

Similar to *peracensis* but with the racket very much longer, narrower, and more tapering.

SPECIMENS EXAMINED: Southeastern Siam: Khao Kuap (mountain east of Ban Bang Phra, on the Cambodian border), 1 ad. ♂, 1 ad. ♀.

MEASUREMENTS: Of the type only, from the literature: wing, male, 130.0; O.T.F., 580.0; bare shaft, 125.0; length of racket, 330.0. Eight paratypes (six males, two females) have a wing that varies in length from 130.0 to 139.0.

RANGE: Apparently confined to the mountains of southern Cambodia—Elephant and Cardamomes Range; intergrades with *peracensis* at the northern end of the Cardamomes at or near the Siamese-Cambodian border.

DISCUSSION: The two specimens listed above from Khao Kuap are properly speaking not true *lefoli* but rather intermediate between that form and *peracensis*. The racket

of the male measures 280.0 in length by 13.0 in width, whereas in a series of 11 adult males of *peracensis* from southern Annam, southeastern Siam, and the southern Malay Peninsula, the range of variation is 154.0 to 228.0, average 180.0, in length, by 14.0 to 20.0, average 16.25, in width.

As *D. remifer* is never found in the lowlands, the birds inhabiting the mountains of southern Cambodia are, except at the northern end of this mountain chain, completely isolated from all other populations by the waters of the Gulf of Siam and the intervening lowlands of Cochinchina and central Cambodia. At the southern end of the chain is *lefoli*, described from Bokor, with the longest racket; at the northern end is *peracensis* with shorter racket, and in between are birds with the rackets intermediate. It is probable that the very long racket of *lefoli* was developed in the isolation of the extreme southern end of the range and possibly gradually gets smaller as the populations work northward from Bokor.

DICRURUS BALICASSIUS

BALICASSIAO

Dicrurus balicassius is restricted to the Philippines, its range including the northern half of the Eastern Province, and all of the Central or Visayan Province, with the exception of the small island of Tablas. In the remaining parts of the archipelago it is replaced by *D. hottentottus* which occupies the southern half of the Eastern Province down to and including Basilan, as well as Tablas and the Palawan group of islands.

On Luzon *D. balicassius* can be divided into two races; a larger one with a considerably longer and heavier bill (*abraensis*) occupies the northern part of the island, the nominate race being found in the central and southern parts and on some of the neighboring islands. A third race (*mirabilis*) occupies the Central Province. The appearance of the first two is similar, but that of *mirabilis* with its pure white abdomen is very distinct.

GENERAL DESCRIPTION OF THE SPECIES

Whole upper plumage black, very strongly glossed with metallic cool blue green changing to purplish. With the exception of the lores and frontal feathers, which are pure

velvety black, the gloss extends over the whole of the upper surface of the body including the tail. On the feathers of the crown, hind neck, throat, and upper breast the gloss is largely limited to the tips and margins of the feathers, giving them a pointed appearance. The feathers at the sides and back of the neck are lanceolate in shape and form short hackles. The frontal feathers are more or less prolonged and curve forward to a varying distance over the ridge of the culmen.

Under surface of the body black and glossy or pure white from the lower breast down. In the black forms, the feathers of the flanks and rump are also white, or light gray, but this color is concealed by the tips of the feathers which are black and glossy. Often these dark tips may be missing or worn away and the white shows through.

Tail definitely but shallowly forked and almost straight, the ends of the outer rectrices being flat, not curling upward, and curving only very slightly outward.

Immatures similar to adults, but browner and much less glossy, particularly on the underparts.

Dicrurus balicassius balicassius Linnaeus

Corvus balicassius LINNAEUS, 1766, *Systema naturae*, ed. 12, vol. 1, p. 157. Philippines. Based on "le Choucas des Philippines," Brisson, 1760, *Ornithologia*, vol. 2, p. 31, pl. 2, fig. 1.

Edolius viridescens GOULD, 1836, *Proc. Zool. Soc. London*, p. 6. Manila.

Dicrurus balicassius mindorensis MEARNS, 1909, *Proc. U. S. Natl. Mus.*, vol. 36, p. 447. Mt. Halcon, 3000 feet, Mindoro. (Type in U.S.N.M.)

Gloss generally cool blue green. Abdomen black, the feathers of the flanks and rump silky, white or light silvery gray, except at the tips which are black and glossy. Frontal feathers more prolonged and curving farther forward than in the other two races.

SPECIMENS EXAMINED: Marinduque, 1 ad. ♀.

Mindoro: Mt. Halcon, "3000 feet," 1 ad. ♂ (the type of *D. b. mindorensis*), 1 ad. ♀; Buena Vista Hill, 1 ad. ♀; Subaan, 1 ad. ♀ (the paratypes of *D. b. mindorensis*). Mt. Halcon, Bignay, 3 ad. ♂, 1 ad. ♀; Calapan, 1 ad. ♂; Pola, 2 ad. ♀; no locality, 1 ad. ♂.

Southern Luzon: Sorsogon Province: Sorsogon, 11 ad. ♂, 7 ad. ♀, 1 unsexed ad. Albay Province: Libog, 1 imm. ♂; Mt. Mayon, 1 ad. ♀; Viga,

1 ad. ♀. Southern Camarines Province, no locality, 1 ad. ♂. South central Luzon: Laguna Province: Mt. Banahao, 1 ad. ♂; Mt. Maquiling, 2 ad. ♂, 1 ad. ♀, 1 imm. ♀; Rizal Province: Quisao, 1 ad. ♀; Sampaloc, 1 ad. ♂; Montalban, 1 ad. ♀. Central Luzon: Pangasinan Province: Bayambang, 2 ad. ♀. Luzon, no locality, 1 ad. ♂, 1 ad. ♀, 3 unsexed ad.

MEASUREMENTS: Length of bill, male, 19.0–22.0 (20.84); female, 19.0–22.5 (21.25). Wing, male, 133.0–150.0 (141.43); female, 135.0–147.5 (140.46). O.T.F., male, 109.5–123.0 (115.07); female, 110.5–121.0 (115.40). C.T.F., male, 97.0–114.0 (105.10); female, 99.0–110.5 (105.25). Depth of fork, male, 6.5–16.5 (10.0); female, 1.5–19.0 (10.20).

RANGE: Central and southern Luzon, Polillo (McGregor), Lubang (McGregor), Verde (McGregor), Marinduque, Mindoro.

DISCUSSION: Mearns separated the birds of Mindoro as *mindorensis* on the basis of their being "Slightly larger than *Dicrurus balicassius* from Luzon Island; also differing in having the metallic reflections of the upper parts and breast greenish blue instead of bluish green." His material consisted of four specimens, one adult male and three adult females. The type, adult male, and one of the paratypes were collected at 3000 feet of altitude on Mt. Halcon, the other two paratypes coming from elsewhere on Mindoro.

These four specimens of Mearns are included in my material, along with eight additional specimens from Mindoro, four of these being topotypes. The individual measurements of all the Mindoro specimens, together with the range of variation and averages of a series from Luzon from the southern end, up to and including Rizal Province, are given as follows (in the Mindoro series, t = type and tp = topotype, one of these latter, a female, being also a paratype):

Wing: Mindoro, male, 139, 141 (tp), 142 (tp), 142, 148 (tp), 150 (t), average (143.66); female, 138, 140 (tp), 141, 143, 145, 147.5 (tp), average (142.41). Southern Luzon, 17 males, 133.0–148.0 (140.76); 10 females, 135.0–145.0 (139.05).

Bill: Mindoro, male, 19, 20.5, 20.5 (tp), 21 (tp), 21.5 (t), average (20.50); female, 19.3, 19.8, 21 (tp), 21.5 (tp), 22, 22.5, average (21.01). Southern Luzon, 16 males, 19.0–22.0 (20.93); 11 females, 20.0–22.5 (21.41).

O.T.F.: Mindoro, male, 110.5 (tp), 115 (tp), 116, 117.5 (tp), 123 (t), average (116.40); female, 114 (tp), 114.5, 114.5, 118, 119 (tp), 120.5, average (116.75). Southern Luzon, 17 males, 109.5–122.0 (114.68); 10 females, 110.5–122.0 (114.75).

The averages of the Mindoro series, except for those of the bill which are identical, are a couple of millimeters larger than in the Luzon birds but it can be seen that, with the exception of the wing length of the type and of the female paratype, the overlap is complete between the Mindoro series and the one from southern Luzon. Both of these slightly larger birds, as I have mentioned, come from Mt. Halcon. The four additional topotypes are smaller and identical in measurements with many other birds from southern Luzon.

The difference in the color of the metallic reflections is very difficult to assess correctly as it may depend entirely on the freshness of plumage, and unless it is associated with other differences it is best not to use it for discrimination. In the case of the Mindoro specimens, Mearns is perfectly correct when he says that the color of the gloss on his specimens differs from that of the birds from southern Luzon. However, in the other specimens from Mindoro, including all the other topotypes, the gloss is just as green and does not differ in any respect from my series of birds from southern Luzon. In northern Luzon, on the other hand, we find birds in which the gloss is even more purplish than in the specimens of Mearns from Mindoro. In the northern Luzon birds this difference in color may be significant since it is associated in their case with other well-marked differences.

McGregor lists *mindorensis* as a synonym of *balicassius*. I agree that it would be very difficult to recognize it, since the additional material from Mindoro fails to support either a true difference in size or any constant difference in the color of the gloss.

Hartert (1919, p. 131) believes that the name *viridescens* of Gould should be used for this form instead of *balicassius*. His reason is that since *balicassius* is based solely on the bird described and figured by Brisson as having, as Hartert says, "a deeply forked tail," it cannot be the same bird as the "Manila Drongo" which, as Hartert claims,

differs from nearly all other drongos "by *not* having a forked tail." However, reference to Brisson shows that he nowhere states or even implies that his bird has "a deeply forked tail"; he merely says that it has "la queue fourchue." Brisson's description is long and carefully detailed and leaves no doubt as to this point. The figure is poor, but it only shows a bird in which the tail is forked, not one in which it is deeply so, and despite Hartert's statement, the "Manila Drongo" *does* have a forked tail, its depth being not inferior but rather greater than quite a few other drongos. Furthermore, the statement of the locality as given by Brisson is explicit. He not only gives the correct native name of the bird, "Bali-Cassio," but also says, "On le trouve aux Isles Philippines, d'où il a été apporté à M. de Réaumur par M. Poivre."

I feel that *balicassius* is well founded and since it has priority it should not be upset by the substitution of the name of Gould (*viridescens*).

***Dicrurus balicassius abraensis* Vaurie**

Dicrurus balicassius abraensis VAURIE, 1947, Amer. Mus. Novitates, no. 1335, p. 2. Bucay, Abra Province, northern Luzon. (Type in A.M.N.H.)

Similar to *balicassius* but with a longer wing and a longer and more robust bill. Tail of the same length, but, being even less forked, squarish in shape. Gloss less cool blue green, much more purplish. Gray or white of the flank and rump feathers more restricted.

SPECIMENS EXAMINED: Northern Luzon: Abra Province, Bucay, 1 ad. ♂ (the type of *D. b. abraensis*). Ilocos Norte Province, Bangui, 1 ad. ♂. Cagayan Province, Peñablanca, 1 ad. ♀; Cape Engaño, 1 ad. ♀ (the paratypes of *D. b. abraensis*).

MEASUREMENTS: Length of bill, male, 25.5, 26.5; female, 25.5, 25.5. Wing, male, 151.5, 156.5 (154.0); female, 148.0, 152.0 (150.0). O.T.F., male 116.0, 122.0, (119.0); female, 113.0, 115.0 (114.0). C.T.F., male, 111.0, 119.0 (115.0); female, 108.0, 116.0 (112.0). Depth of fork, male, 3.0, 5.0 (4.0); female, -1.0, 5.0 (2.0).

RANGE: Northern Luzon, intergrades with *balicassius* in north central Luzon in the region of the Lingayen Gulf or a little to the south of it.

DISCUSSION: This form probably ranges all through northern Luzon; from the Lingayen Gulf south it apparently intergrades with *balicassius*. The most northern of my specimens of this latter are two adult females from Bayambang, a little to the south of the gulf in Pangasinan Province. Their wing length, 142 and 146 (144.0), and their bill length, 23 and 23.5, are greater than in typical *balicassius* from Manila southwards. Both of these measurements are intermediate between those of the females of *balicassius*, wing, 140.46, bill, 21.25, and those of *abraensis*, wing, 150, bill, 25.5.

***Dicrurus balicassius mirabilis* Walden and Layard**

Dicrurus mirabilis WALDEN AND LAYARD, 1872, Ibis, p. 103, pl. 5. Negros.

Similar to *balicassius* but with the striking exception that the under plumage from the breast down and over the abdomen and under tail coverts is pure silky white. Flanks grayish.

SPECIMENS EXAMINED: Ticao, 1 ad. ♂, 1 ad. ♀. Masbate, 2 ad. ♂, 1 ad. ♀. Panay, 1 ad. ♂, 1 ad. ♀, 1 unsexed ad. Guimaras, 1 ad. ♂, 2 ad. ♀. Negros: no locality, 1 ad. ♂, 1 ad. ♀; Bais, 3 ad. ♀; Canboan Volcano, 1 ad. ♂, 1 ad. ♀. Cebu, Toledo, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 22.0–24.0 (23.0); female, 22.5–24.5 (23.83). Wing, male, 134.0–141.0 (137.50); female, 135.0–143.0 (138.41). O.T.F., male, 111.0–118.5 (114.57); female, 109.0–122.0 (114.50). C.T.F., male, 101.0–109.0 (104.0); female, 101.0–111.5 (107.58). Depth of fork, male, 7.0–15.0 (10.56); female, 3.0–10.5 (7.0).

RANGE: Ticao, Masbate, Panay, Guimaras, Bantayan (McGregor), Cebu, Negros, and possibly Siquijor (Bourne, quoted by McGregor).

SUPERSPECIES *HOTTENTOTTUS*

This superspecies is made up of three members, *Dicrurus hottentottus*, *D. montanus*, and *D. megarhynchus*. The last two are monotypic species, but *hottentottus* is polytypic and is characterized by a large number of races, 32 in all, which replace one another throughout its enormous range. This range, the most extensive of that of any drongo, extends from

the northwestern Himalayas to northern China on the continent of Asia, and through the whole of the Indo-Malayan and Austro-Papuan regions as far as the eastern Solomons and southeastern Australia.

Some of these forms show considerable deviation from one another—in fact, *hottentottus* is one of the most variable of all birds—but nevertheless all these forms, including the two monotypic species which are also found within the range of *hottentottus*, always retain certain well-marked characters in common. All have a velvety or dull back contrasting strongly with metallic wings and tail, have glossy neck hackles, and are spangled on the crown, throat, and upper breast.

It is obvious that all these forms have had a common origin. In the section on phylogeny it was mentioned that *hottentottus* appears to have been derived from a *macrocerus*-like ancestor by way of a form similar to present-day *annectans*. This form invaded the Philippines from the continent of Asia and spread throughout the archipelago to develop ultimately into what are today *balicassius* and *hottentottus*. The fact that the characters of *balicassius* are somewhat intermediate between those of *annectans* and *hottentottus* suggests that this latter was not derived directly from *annectans* but through *balicassius* instead.

Dicrurus balicassius and *D. hottentottus* are strict geographical representatives and could be included within the same superspecies. However, owing to certain differences which appear to be of fundamental importance in *hottentottus*, such as the presence of true and sharply defined spangles and the lack of gloss on the back, the two are perhaps best considered apart.

The two races of *hottentottus* in the southeastern Philippines both have short tails with very shallow forks, the tail getting progressively longer and the fork deeper as the range of the populations extends farther and farther south. The next step to be reached on this southward dispersal appears to have been Morotai and then Halmahera. The Morotai race retains the shape and size of the bill of the races of the southeastern Philippines but its other characters, such as the length of the tail, as well as general size and plumage are

intermediate between those of the Philippine races and that of Halmahera.

A certain part of the invaders from the Philippines, instead of reaching Halmahera directly via Morotai, may have first gone to Celebes and, after having left behind a population from which *D. montanus* was derived, crossed over to Halmahera.

Once the Moluccas were reached, either directly or indirectly, or both, these islands appear to have then acted as a secondary evolutionary center from which successive waves of expansion dispersed in all possible directions. The factors responsible for this widespread dispersal are unknown. Probably they were ecological, the new arrival, a descendant from a plastic and aggressive stock, finding perhaps an abundance of ready-made ecological niches awaiting it. Whatever the reason may have been, it is possible to retrace the various waves. The probable routes that they followed are shown in figure 9.

The characters of the present day races indicate that the first expansion to take place from Halmahera proceeded to New Guinea, and after having sent a side extension to New Britain and from there to New Ireland, finally ended in the eastern Solomons and Australia. From Halmahera the birds also spread to the southern Moluccas, this invasion taking place perhaps at the same time that the birds were expanding to New Guinea.

All the races derived from the original invaders and, including these, may be referred to as wave A. All the remaining races appear to have been derived from two other waves, B and C.

Wave B: This wave proceeded southward to the Lesser Sundas, where at Timor it split into two, the two parts then continuing to flow independently and in opposite directions, one eastward to the Tenimbers and the islands of the outer Banda Arc, the other westward to Sumba, Sumbawa, Flores, and Lombok, to end finally in Sumatra.

Wave C: Westward to Celebes via Obi and Sula; from Celebes a side extension went southward through the Java Sea to populate the Kangeans, Bali, and the Thousand Islands, finally crossing the Sunda Strait to end in the Mentaweis. The main body of this wave, however, passed on to Borneo whence,

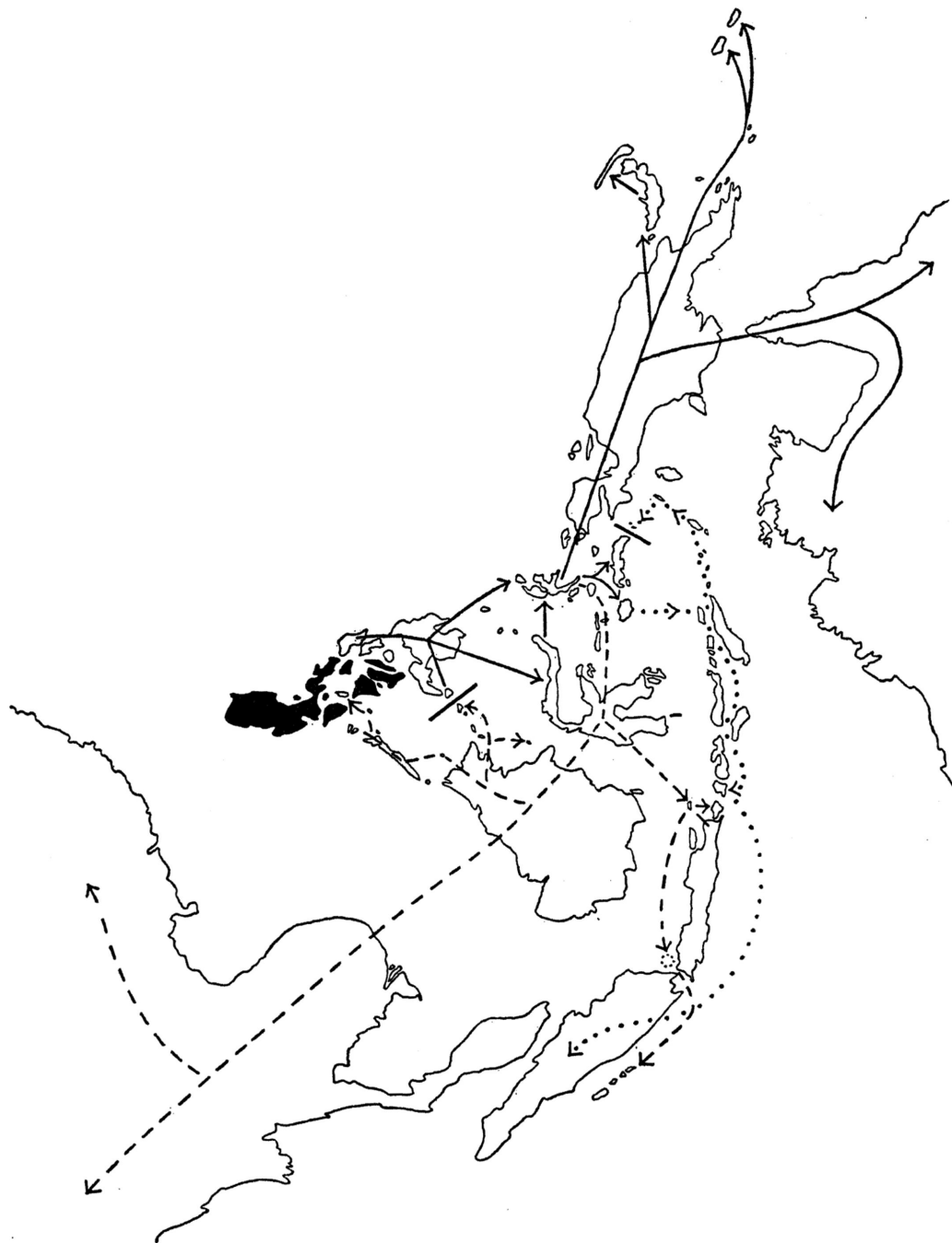


FIG. 9. Routes of dispersion followed by *Dicrurus hottentottus*. *D. hottentottus* was derived from the southeastern Philippines; the range of its geographical representative in the Philippines (*Dicrurus balicassius*) is shown in solid black. Wave A of *D. hottentottus* is represented by solid lines, wave B by dotted lines, and wave C by broken lines.

after having sent extensions into the Sulus and the Palawan group of islands and from there to Tablas, it crossed over to the continent.

These "waves" are of course not to be taken literally, but there is too much evidence to question the fact that the dispersal was along successive lines. The races derived from wave A must be older, for it is as parts of this wave that *D. montanus* and *D. megarhynchus* originated. Since Celebes was reinvaded by wave C, *D. montanus* must have preceded the race that developed from the newer arrival by a time interval sufficiently long for it to have developed reproductive isolation. Also, there does not seem to be any reason why *hottentottus*, after having reached the Sulus, should not have taken the additional small step to Basilan, if it had not been for the fact that an older race of *hottentottus* was already in possession. The same thing is true for the failure of the birds of wave B to continue across the few more miles that separate Gorong from Ceram, and probably for the failure of their reaching Australia from Timor.

Further, in each main wave and especially in the subsidiary waves, the races intergrade into one another, sometimes perfectly so as in wave C but, significantly enough, less so in wave B and least of all in wave A.

The order followed in this revision of the superspecies is the order of the waves. Wave A starts with the two southeastern Philippine races; after Halmahera the successive races of the eastern extension are taken up. *D. h. laemosictus* and *D. megarhynchus* are placed after *D. h. bracteatus*, although they are not derived from it but rather from *D. h. carbonarius* of New Guinea. The western extension of wave A (*D. montanus*) and the races of the southern extension follow those of the eastern extension. In wave C the races of the southern extension are placed directly after the Celebes race (*D. h. leucops*), although the main evolutionary line flows directly from Celebes to Borneo, and from there to the continent, the races of the extension into the southwestern Philippines being placed last although they are derived directly from Borneo and not from the continent.

This seems to be the most sensible order. As far as possible the evolutionary lines are

not broken up, but the mentioned exceptions, plus another one or two, were unavoidable since it is not possible to arrange the complicated phylogeny in a single linear sequence.

GENERAL DESCRIPTION OF THE SUPERSPECIES

Whole plumage black or blue black, glossed, sometimes very highly so, with metallic purplish blue green or greenish. Above, the gloss is definitely restricted to the feathers of the crown, wing coverts, outer web of the primaries, and upper surface of the tail and contrasts strongly with the mantle, which, when seen from above, is dull or velvety, a few scanty traces or threads of gloss showing in one or two forms. When seen from the side, the dull mantle takes on, as in the case of *D. adsimilis coracinus*, a more or less pronounced amount of diffused gloss. On the feathers of the crown, throat, and upper breast, the gloss is limited to the tips and marginal ends of the feathers, giving to the feathers of the crown a scaly appearance. On the throat and upper breast the glossy feathers are well separated from one another and more or less abundant, and form true, sharply defined, oval, or pointed spangles. The feathers on each side of the neck are glossy and prolonged into true hackles. The intensity of the gloss is at its most brilliant on the crown, hackles, spangles, and wing coverts. The gloss is completely lacking on the lores and frontal feathers, which are velvety, and, with the exception of the spangles and of slight traces on the under tail coverts, is also lacking from the underparts, or greatly modified into a sort of diffused sheen.

Immatures are smaller and duller, and the quills are brownish. The spangles are much fewer and smaller, and the hackles are shorter or lacking. In many forms the axillaries and sometimes the under tail coverts are tipped with white to a varying degree, the white axillary tips occasionally persisting in the adult form.

REMARK ON THE MEASUREMENTS

In the superspecies *hottentottus* the length of the bill was measured from the anterior border of the nostril, rather than from the skull as in all the preceding drongos.

DICRURUS HOTTENTOTTUS

SPANGLED DRONGO

The range of the species and the number of its races (32) have been mentioned above under the superspecies.

The species itself (*hottentottus*) differs from the other two members of the superspecies as follows:

From *D. megarhynchus*, only by the structure of the tail. In *megarhynchus* the outer tail feathers are enormously prolonged and are at least twice as long as the wing. In *hottentottus* these feathers are not so prolonged; the great majority of the races have a tail that is comparatively short, averaging usually from about 80 to 90 per cent of the length of the wing, and in these the fork is rather shallow, ranging from about 10 to 25 mm., with an average of about 16. There are, however, several forms in which the tail is as long as the wing, or longer (108 to 129 per cent greater) and in these the furcation is proportionately deeper. In the forms with the shortest tail, the outer rectrices are straight or nearly so, and the fork is so shallow that the tail is squarish. In the more normally shaped tails, the outer rectrices curve outward and their tips curl upward, becoming completely turned over in some forms.

From *D. montanus* it does not differ, and *montanus* is separable from a sympatric race of *hottentottus* only by a difference in size.

GROUP A

This group includes 12 races of *hottentottus* and the other two members of the superspecies, *D. megarhynchus* (New Ireland) and *D. montanus* (mountains of Celebes). The 12 races are further divisible into several subgroups: (a) the transitional forms of *samarensis* (Samar and Leyte), and *striatus* (Basilan and Mindanao), which through *morotensis* (Morotai) connect *D. balicassius* of the northern and central Philippines to *D. hottentottus* of the Moluccas; (b) a compact group of closely related races which is made up of *atrocaeruleus* (Halmahera), *carbonarius* (New Guinea), *bracteatus* (Australia), and *laemostictus* (New Britain); (c) two aberrant peripheral races in the eastern Solomons, *meeki* (Guadalcanal), and *longirostris* (San Cristobal); (d) three forms from the southern Moluccas with a characteristic type of bill, *manumeten* (Ce-

ram), *amboinensis* (Amboina), and *buruensis* (Buru). This group, taken as a whole, is what I have termed the older forms, or wave A.

As is evident from this subdivision, this group lacks homogeneity, the subdivisions do not closely intergrade into one another, and as a result characters which hold good within each subdivision break down for the group as a whole. Although no character that would be "typical" of group A can be selected, there is one common to the large majority of the forms. This character, which was first encountered in *D. balicassius*, is the peculiar feathering at the base of the bill. In *D. balicassius* the frontal feathers, especially in the forms from Luzon, are prolonged forward as bristly little plumes which curve forward over the ridge of the culmen. In *D. megarhynchus*, *D. montanus*, and the races of subdivisions a and b, all of which are phylogenetically closest to *D. balicassius*, these feathers are very well developed and extend from about half to two-thirds of the total length of the culmen (fig. 10). In subdivision b the one race that is farthest removed (*bracteatus*) also has the shortest feathers. These feathers are missing from one of the two races of subdivision c and from all those in subdivision d.

These prolonged frontal feathers are also present in some of the races of group B, but with one or two exceptions are less developed. In the races of group C they are missing altogether, or rather modified, in the typical races, into a crest made up of hair-like filaments which curve backward over the crown.

No other character can be selected that does not vary a great deal from subdivision to subdivision. In fact it is in group A that the variability of the superspecies as a whole is at its greatest. The most variable characters are the shape and length of the tail, the shape of the bill and the length of its rictal bristles, the intensity of the gloss, which varies from the most brilliant to the dullest, the abundance, size, and shape of the spangles, and the length of the hackles. In many forms of group A the spangles and hackles are well developed in size and number, but less so than in group B and much less so than in group C, and it is in group A that we find the forms with the fewest and smallest spangles and the shortest and narrowest hackles.

***Dicrurus hottentottus samarensis* Vaurie**

Dicrurus hottentottus samarensis VAURIE, 1947, Amer. Mus. Novitates, no. 1335, p. 1. Bonga, Samar. (Type in A.M.N.H.)

General color blue black with brilliant gloss. Neck hackles very short, throat and breast spangles abundant, but very narrow and striated in appearance. Tail straight, very short and square.

SPECIMENS EXAMINED: Samar, Bonga, 1 ad. ♂ (the type of *D. h. samarensis*); Catbalogan, 2 ad. ♂, 5 ad. ♀, 1 subad. ♀; no locality, 1 ad. ♂ [?]. Leyte, "northern mountains," 1 imm. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 21.0–23.0 (22.12); female, 23.0–24.5 (23.40). Wing, male, 131.0–139.0 (136.0); female, 130.0–135.5 (132.60). O.T.F., male, 90.0–99.0 (93.25); female, 93.0–97.0 (94.67). C.T.F., male, 87.0–98.0 (92.25); female, 89.0–97.0 (92.33). "Depth of fork" (average), male, 1.0; female, 1.29.

RANGE: Samar, Leyte, and possibly Panaon (Everett) and Bohol (McGregor).

DISCUSSION: This form and the following one (*striatus*) are intimately related and differ from each other mainly by the length of the tail and the depth of its fork. Vaurie (1947) has shown in a series of measurements how the tail becomes progressively longer and the fork deeper as the populations range south from Leyte and Samar to eastern Mindanao and from there through western Mindanao to Basilan.

Both forms are typical *hottentottus* but to a certain extent are transitional between this species and *D. balicassius*. The shape of their tail is like that of *balicassius* and their gloss is just as brilliant, but a very significant change in its distribution shows that they have departed from this species. Both *samarensis* and *striatus* now show the fundamental characters of *hottentottus*: a mantle which, when seen from above, is no longer glossy but velvety, and true and sharply defined spangles on the throat and upper breast.

***Dicrurus hottentottus striatus* Tweeddale**

Dicrurus striatus TWEEDDALE, 1877, Proc. Zool. Soc. London, p. 545. Pasananca [near Zamboanga], Mindanao.

Similar to *samarensis* but with the tail

longer and slightly forked, and with a tendency for the throat and breast spangles to be slightly broader.

SPECIMENS EXAMINED: Eastern Mindanao: Santa Cruz, 1 ad. ♀; Daliao, 4 ad. ♂, 1 subad. ♀; Mailag, 1 ad. ♂; Ryaba, 1 ad. ♂; Kabawi, 1 ad. ♂; Mucas, 1 ad. ♂; Lake Lanao, 1 ad. ♂, 2 ad. ♀, 1 subad. ♀, 2 unsexed ad.; Pantar, near Lake Lanao, 1 ad. ♂, 6 ad. ♀, 1 subad. ♀. Western Mindanao: Catagan, 2 ad. ♂, 2 ad. ♀; Ayala, 1 ad. ♂; Zamboanga, 2 ad. ♂, 2 ad. ♀.

Basilan: Isabela, 2 ad. ♂, 1 ad. ♀; Musser's Place, 1 ad. ♂; "15 Km. NE of Maluso," 1 ad. ♂, 1 ad. ♀; no locality, 4 ad. ♂, 3 ad. ♀.

MEASUREMENTS: Length of bill, male, 21.0–24.0 (22.23); female, 21.0–24.0 (22.26). Wing, male, 129.0–140.0 (134.70); female, 131.0–142.0 (135.25). O.T.F., male, 100.0–113.0 (105.0); female, 102.0–111.5 (106.0). C.T.F., male, 94.0–106.0 (99.0); female, 97.0–103.0 (100.60). "Depth of fork" (average), male, 6.0, female, 5.40.

RANGE: Nipah (Everett), Mindanao, Basilan.

***Dicrurus hottentottus morotensis* Vaurie**

Dicrurus hottentottus morotensis VAURIE, 1946, Auk, vol. 63, p. 82. Morotai Island. (Type in A.M.N.H.)

Dicrurus bracteatus morotaiensis VAN BEMMEL, 1947, Zool. Meded., vol. 28, p. 285. Mira Island, Morotai. (Type in Leiden Mus.)

General color blue black, gloss considerably duller than in either *samarensis* or *striatus*. Neck hackles slightly longer. Throat and breast spangles shorter and broader. Except for the bill, which is identical in shape and size but a little more feathered at its base, the general body size is larger, the wing and tail being considerably longer and the fork deeper.

SPECIMENS EXAMINED: Morotai Island: 1 unsexed ad. (the type of *D. h. morotensis*), 1 unsexed ad. (the paratype).

MEASUREMENTS: Length of bill, 19.5, 20.0 (19.75). Wing, 148.0, 149.0 (148.50). O.T.F., 134.0. C.T.F., 115.0, 115.0. Depth of fork, 19.0.

RANGE: Morotai Island.

DISCUSSION: This race is of considerable interest from the standpoint of phylogeny as well as zoogeography. Its bill is identical to that of the Philippine races, but the appear-

ance of its plumage is closer to the races of the Moluccas and Austro-Papuan region, and the general body size is intermediate. Also intermediate are the shape and size of the throat and breast spangles.

The retention of the bill of the Philippine races together with the increase in body size and the intermediate shape of the spangles shows *morotensis* to be the possible link that connects the races of the southeastern Philippines to the other members of group A.

***Dicrurus hottentottus atrocaeruleus* Gray**

Dicrurus atrocaeruleus GRAY, 1860, Proc. Zool. Soc. London, p. 354. Batchian and E. Gilolo [Halmahera] Islands.

Resembles *morotensis* but much larger. The bill considerably longer and much heavier in every way with the frontal feathers very well developed and the rictal bristles

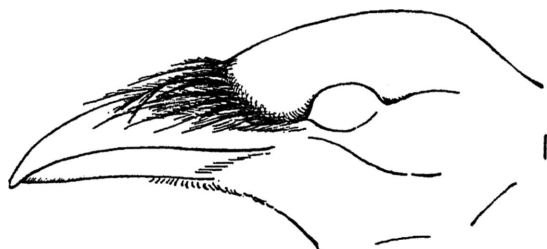


FIG. 10. Head of *Dicrurus hottentottus atrocaeruleus*.

long and strong (fig. 10). Throat and breast spangles larger. The ends of the outer rectrices are moderately curved outward and upward. General color strongly bluish black with deep purplish iridescence to the gloss.

SPECIMENS EXAMINED: Halmahera: southeastern peninsula, Patani, 1 ad. ♂, 1 ad. ♀; Jepeleu, near Patani, 1 ad. ♂; no locality, 1 imm. ♀, 4 unsexed ad., 1 unsexed imm. Batjan Island: Penambuan, 1 ad. ♂; no locality, "5-7000 feet," 8 ad. ♂, 1 imm. ♂, 2 ad. ♀.

MEASUREMENTS: Length of bill, male, 22.0-25.5 (23.44); female, 22.0-24.0 (23.0). Wing, male, 168.0-181.5 (171.93); female, 162.5-165.0 (163.50). O.T.F., male, 150.0-165.0 (155.57); female, 142.0-153.0 (147.0). C.T.F., male, 132.0-143.5 (139.27); female, 131.0-139.0 (133.66). Depth of fork (average), male, 16.30; female, 13.34.

RANGE: Batjan and Halmahera Islands.

DISCUSSION: With *atrocaeruleus* we come to a natural, compact group made up of the four closely related races which form subdivision b of group A. All these races are large birds and in addition to *atrocaeruleus* consist of *carbonarius* in New Guinea, *bracteatus* in Australia, and *laemostictus* in New Britain. To these four must be added the large *Dicrurus megarhynchus* of New Ireland which was obviously derived by way of New Britain. Though by now probably specifically distinct, this latter very intimately fits in with these four forms and cannot be considered apart from them.

The resemblance of the four main races to one another is very close. Of the four, *atrocaeruleus* is separable only by being a little the larger; *laemostictus* is identical in size with *carbonarius* but is a glossier bird, all three races differing in turn from *bracteatus* by the color of their gloss which is purplish blue rather than greenish. That the separation of *bracteatus* may be more ancient than that of the other three from one another is shown by additional characters, such as a more exposed culmen and a tendency towards white barring below in the immatures.

As the measurements of these four races are fairly close to one another, the following table (table 5) summarizes the more important measurements. In table 5, following these four forms, I have added for purposes of comparison the measurements of *D. megarhynchus* and following this form those of all the other forms of group A. The measurements are those of adult males, except in the case of *morotensis* where the two specimens are unsexed. The depth, or height, of the bill is taken at the level of the nostril and is the average of six adult males taken at random, except in the case of the following exceptions where the adult specimens consist of: *samarensis* (four males, two females), *morotensis* (two unsexed), *meeki* (two males, one female), *manumeten* (two males, two females), *amboinensis* (four males, one female), *D. montanus* (four males, two females).

***Dicrurus hottentottus carbonarius* Bonaparte**

Dicrurus carbonarius BONAPARTE, 1851, Conspectus generum avium, vol. 1, p. 352. New

Guinea; type locality, Lobo, Triton Bay, as fixed by Stresemann, 1923, Arch. Naturgesch., vol. 89, div. A, no. 7, p. 46. (Type in Leiden Mus.)

Dicrurus assimilis GRAY, 1858, Proc. Zool. Soc. London, p. 178. Aru Islands. [Not *Corvus* (= *Dicrurus*) *adsimilis* Bechstein, 1794.]

Chibia propinqua TRISTRAM, 1889, Ibis, p. 556. D'Entrecasteaux Archipelago.

Chibia carbonaria dejecta HARTERT, 1898, Novitates Zool., vol. 5, p. 522. Sudest [= Tagula] Island, Louisiade Archipelago. (Type in A.M.N.H.)

Dicrurus bracteatus stellatus NEUMANN, 1922, Verhandl. Ornith. Gesellsch. Bayern, vol. 15, p. 236. Friedrich Wilhelmshafen [= Madang], Astrolabe Bay.

vink Bay: "30-50 miles above mouth of Siriwo River," 2 ad. ♂, 1 imm. ♂, 1 ad. ♀; lower Menoo River, 1 ad. ♂, 1 unsexed imm.

Islands of Geelvink Bay: Numfor, 4 ad. ♂, 1 imm. ♂, 1 ad. ♀. Biak: no locality, 1 ad. ♂; Korido, 2 ad. ♀. Japen: Seroei, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀; Ansus, 1 imm. ♀. East Geelvink Bay, near Noeboai, 1 ad. ♂, 3 imm. ♀.

Southwestern coast: Upper Setekwa River, 1 ad. ♂, 5 ad. ♀.

Aru Islands: Barkai, 1 ad. ♂, 1 ad. ♀; Kobror, 1 ad. ♂, 1 ad. ♀; Dobo, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀.

Northern New Guinea to Astrolabe Bay: Takar, 1 ad. ♂, 1 imm. ♂; Ifar, 2 ad. ♂, 2 ad. ♀, 1 imm.

TABLE 5

COMPARATIVE MEASUREMENTS OF ADULT MALES OF *D. montanus* AND *D. megarhynchus* AND OF THE FORMS IN GROUP A OF *D. hottentottus*

Form	N	Length of Bill ^a	Depth of Bill	Length of Wing	Length of O.T.F.	Depth of Fork ^b
<i>D. h. atrocaeruleus</i>	11	22.0-25.5 (23.44)	12.66	168.0-181.5 (172.00)	150.0-165.0 (155.57)	16.30
<i>D. h. carbonarius</i>	123	20.5-24.5 (21.86)	12.86	142.0-162.0 (152.00)	125.0-149.0 (135.12)	16.76
<i>D. h. bracteatus</i>	35	22.0-25.0 (23.59)	13.00	152.0-167.0 (160.45)	125.0-136.0 (130.00)	14.16
<i>D. h. laemostictus</i>	24	20.5-25.0 (22.72)	11.63	141.0-159.0 (151.00)	128.0-147.0 (136.50)	20.90
<i>D. megarhynchus</i>	8	26.0-27.0 (26.25)	13.43	182.0-186.0 (183.75)	375.0-390.0 (384.50)	230.40
<i>D. h. samarensis</i>	4	21.0-23.0 (22.12)	10.50	131.0-139.0 (136.00)	90.0-99.0 (93.25)	1.00
<i>D. h. striatus</i>	23	21.0-24.0 (22.23)	10.80	129.0-140.0 (134.70)	100.0-113.0 (105.00)	6.00
<i>D. h. morioensis</i>	2	19.5, 20.0 (19.75)	10.00	148.0, 149.0 (148.50)	134.0 — (134.00)	19.00
<i>D. h. meeki</i>	2	23.0, 23.8 (23.40)	11.90	152.0, 152.0 (152.00)	131.0, 137.5 (134.25)	10.75
<i>D. h. longirostris</i>	9	29.0-33.5 (31.80)	11.87	143.5-154.0 (148.70)	128.0-137.5 (132.75)	6.65
<i>D. montanus</i>	5	17.5-23.0 (19.90)	9.82	131.0-144.0 (140.00)	135.0-150.0 (140.32)	34.98
<i>D. h. manumeten</i>	2	23.0, 23.0 (23.00)	11.17	141.0, 141.0 (141.00)	123.0, 128.0 (125.50)	22.00
<i>D. h. amboinensis</i>	4	22.5-24.5 (23.37)	11.41	147.0-152.0 (149.50)	135.0-141.0 (137.50)	22.00
<i>D. h. buruensis</i>	6	23.5-24.5 (24.00)	11.86	151.5-156.0 (154.62)	163.0-174.0 (168.66)	42.04

^a The length of the bill is measured from the anterior border of the nostril.

^b The tail in *D. megarhynchus* is not forked; this measurement is the difference between the O.T.F. and C.T.F.

Dicrurus bracteatus ultramontanus STRESEMANN, 1923, Arch. Naturgesch., vol. 89, div. A, no. 7, p. 47; new name for *Dicrurus assimilis*, Gray.

Similar to *atrocaeruleus* but smaller in all measurements.

SPECIMENS EXAMINED: Western Papuan Islands: Gebe, 1 imm. ♂, 1 imm. ♀; Misol, 2 ad. ♂, 1 unsexed ad.; Waigeu, 2 ad. ♂, 2 ad. ♀, 1 unsexed ad.; Batanta, 1 ad. ♂, 1 ad. ♀.

Western New Guinea, to the Wanggar River: Vogelkop: Sorong, 2 ad. ♂; Senkedock, 1 ad. ♂; Andai, 1 ad. ♂; Momi, 1 unsexed ad.; Dorey, 1 ad. ♂, 2 imm. ♂; Manokwari, 2 ad. ♂, 1 imm. ♂, 1 unsexed imm. Onin Peninsula, Kapaur, 2 ad. ♂, 2 ad. ♀. Wandammen, Wasior, 1 ad. ♂, 1 imm. ♂, 2 ad. ♀, 1 unsexed imm. Head of Geel-

vink Bay, 3 ad. ♂, 1 imm. ♂, 4 ad. ♀; Cyclops Mts., 3 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 unsexed imm. Idenburg River, Bernhard Camp, 10 ad. ♂, 2 imm. ♂, 5 ad. ♀. Madang, 1 ad. ♂, 3 ad. ♀, 1 imm. ♀, 1 unsexed ad.; Keku, 1 ad. ♀, 2 imm. ♀; Mabau, 1 ad. ♀, 1 imm. ♀; Konstantinshafen, 1 ad. ♂; Stephansort, 1 ad. ♂.

Huon Peninsula: Hompua, 1 ad. ♂; Simbang, 1 imm. ♀; Sattelberg, 1 ad. ♂, 1 imm. ♂, 1 imm. ♀; Finschhafen, 1 imm. ♂, 2 imm. ♀.

Eastern New Guinea: Northern coast to Milne Bay: Aicora River, 1 ad. ♂; Kumusi River, 3 ad. ♂, 2 ad. ♀; Collingwood Bay, Haidana, 1 imm. ♂. Milne Bay area: Milne Bay, 2 ad. ♂; Samarai, 2 ad. ♂. Southern coast, and Owen Stanley Mts.: Mt. Cameron, 1 unsexed imm.; Hydrographer Range, west of Dyke Acland Bay, 4 ad. ♂, 2 ad. ♀, 2 imm. ♀; Orangerie Bay, 1 ad. ♂; Cloudy Bay, 1 imm. ♂; Rona, 2 imm. ♀; Redscar Bay,

Hisiu, 1 ad. ♂; Galley Reach, Kanosia, 1 ad. ♂. Hall Sound: Aroa River, Avera, 1 ad. ♂; Nicura, 1 ad. ♂, 1 imm. ♂; Kubuna, 2 ad. ♀, 1 unsexed imm.

Upper Fly River: D'Albertis Junction, 1 ad. ♀; Oroville Camp, 1 ad. ♂; junction of the Black and Palmer rivers, 6 ad. ♂, 4 ad. ♀; Palmer

D'Entrecasteaux Archipelago: Goodenough Island, 3 ad. ♂, 3 ad. ♀; Fergusson Island, 5 ad. ♂, 2 imm. ♂, 2 imm. ♀.

Louisiade Archipelago: Sudest [= Tagula] Island, 1 ad. ♂ (the type of *C. c. defecta*), 1 ad. ♂, 2 imm. ♂ (the paratypes of *C. c. defecta*), 4 ad. ♂, 3 ad. ♀, 3 imm. ♀.

TABLE 6
AVERAGE MEASUREMENTS OF THE DIFFERENT POPULATIONS OF *D. h. carbonarius*

	Length of Bill		Length of Wing		Length of O.T.F.		Depth of Fork	
	♂	♀	♂	♀	♂	♀	♂	♀
Waigeu	21.75	22.15	157.75	153.75	141.50	131.00	20.50	18.50
Misol	22.25	—	147.50	—	138.00	—	15.50	—
Batanta	21.50	20.00	156.00	152.00	140.00	131.00	20.50	15.00
Numfor	22.95	22.00	148.33	144.00	140.25	—	20.25	—
Biak	23.00	20.50	147.00	146.00	129.00	127.00	18.00	13.00
Western New Guinea to Wanggar River	22.37	22.42	155.80	150.20	137.37	131.80	16.28	15.60
Southwestern New Guinea (upper Setekwa River)	21.00	20.42	151.00	140.00	135.00	122.80	18.00	12.60
Aru Islands	20.26	20.33	146.66	142.83	128.66	125.50	15.00	13.50
Northern New Guinea to Astrolabe Bay	22.12	21.73	151.58	150.02	138.50	133.87	19.16	17.12
Huon Peninsula	22.00	—	158.37	—	130.00	—	11.00	—
Eastern New Guinea, northern coast	21.70	20.75	150.62	137.00	134.50	127.00	20.25	11.50
Eastern New Guinea, Milne Bay	21.45	—	154.75	—	129.33	—	13.00	—
Eastern New Guinea, southern coast	21.35	20.22	154.14	143.50	137.62	130.00	18.50	14.80
Upper Fly River	21.25	19.90	150.85	143.50	132.60	125.80	16.10	13.90
Lower Fly River	20.80	19.52	149.80	143.20	131.25	125.50	15.25	10.60
Trobriand Islands, Kaileuna Island	22.72	22.31	149.92	149.75	132.27	129.00	15.31	13.34
Trobriand Islands, Kiriwina Island	22.33	22.55	151.33	151.50	132.00	131.00	16.34	12.25
Trobriand Islands, Kitava Island	24.13	22.96	154.51	149.20	139.00	130.37	15.34	13.17
D'Entrecasteaux Arch., Goodenough Island	22.33	21.26	155.66	151.33	144.75	136.25	18.75	13.42
D'Entrecasteaux Arch., Fergusson Island	21.56	—	157.00	—	142.87	—	18.07	—
Louisiade Archipelago, Tagula Island	21.56	20.15	144.17	138.33	126.59	—	16.39	—

Junction, 3 ad. ♂, 1 ad. ♀.

Lower Fly River: Oriomo River, Wuroi, 1 ad. ♂, 2 imm. ♀; Wassi Kussa River (west of Daru), Tarara, 3 ad. ♂, 1 imm. ♂, 3 ad. ♀, 4 imm. ♀; Gaima, 1 ad. ♀; Sturt Island, 3 ad. ♂, 1 ad. ♀, 1 imm. ♀.

Trobriand Islands: Kaileuna, 11 ad. ♂, 6 ad. ♀; Kiriwina, 3 ad. ♂, 2 ad. ♀, 3 imm. ♀; Kitava, 6 ad. ♂, 5 ad. ♀.

MEASUREMENTS: Length of bill, male, 20.5–24.5 (21.86); female, 19.5–24.0 (20.88). Wing, male, 142.0–162.0 (152.0); female, 135.5–161.0 (146.80). O.T.F., male, 125.0–149.0 (135.12); female, 121.0–143.0 (130.14). C.T.F., male, 108.0–134.0 (118.36); female, 105.5–128.0 (115.64). Depth of fork (average), male, 16.76; female, 14.50.

The individual wing length of the specimens in table 6 is as follows:

Waigeu: male, 156, 159.5; female, 152.5, 155.

Misol: male, 147, 148.

Batanta: male, 156; female, 152.

Numfor: male, 146, 148, 151; female, 144; unsexed, 162.

Biak: male, 147; female, 145, 147.

Western New Guinea: male, 150, 150, 151, 153, 153, 155, 156, 158, 161, 161, 162; female, 149, 149, 150, 151, 152.

Upper Setekwa River: male, 151; female, 138, 138, 141, 141, 142.

Aru Islands: male, 143, 148, 149; female, 137.5, 145, 146.

Northern New Guinea to Astrolabe Bay: male, 147, 148, 148, 150, 150, 150, 150, 151, 151, 151, 151, 152, 153, 153, 153, 154, 155, 156.5, 158; female, 141, 145, 145, 146, 148, 149, 149, 150, 151, 151, 152, 152, 152.5, 158, 161.

Northeastern coast (east of Madang and Huon Peninsula): male, 157.5, 158, 159, 159.

Eastern New Guinea, northern coast: male, 148, 151, 151.5, 152; female, 137.

Eastern New Guinea, Milne Bay: male, 153, 156.5.

Eastern New Guinea, southern coast and Owen Stanley and Hydrographer ranges: male, 152, 152, 153, 154, 155, 155, 156; female, 139, 142, 145.5, 147.5; unsexed, 143.

Upper Fly River: male, 146, 147, 147, 147.5, 150, 151, 152.5, 153.5, 154, 156; female, 139.5, 141, 144, 146, 147.

Lower Fly River: male, 148, 150, 150, 150, 151; female, 140, 140, 144, 145, 146.

Trobriands, Kaileuna: male, 144, 144, 145, 145, 149, 152, 152.5, 153, 154, 155, 155.5; female, 142, 145, 151, 152.5, 154, 154.

Trobriands, Kitava: male, 151, 153, 154, 154.5, 155, 159; female, 146.5, 148.5, 149, 151, 151.

Trobriands, Kiriwina: male, 150, 151, 153; female, 149, 154.

D'Entrecasteaux, Goodenough: male, 154, 156, 157; female, 150, 151, 153.

D'Entrecasteaux, Fergusson: male, 154, 156, 157, 157, 161.

Louisiades, Tagula: male, 142, 143, 144, 144, 146, 146; female, 135.5, 138.5, 141.

RANGE: The whole of New Guinea, and the islands of Gebe, Kofiau (Salvadori),

Misol, Salawati (Bruijn), Batanta, Waigeu; the islands of Geelvink Bay (Numfor, Biak, Japen); the Aru Islands; the Trobriands (Kaileuna, Kitava, Kiriwina), and the D'Entrecasteaux Archipelago (Goodenough, Fergusson); the Louisiade Archipelago (Tagula).

DISCUSSION: Up to the present, four attempts have been made to separate geographical races from *carbonarius*: Gray, 1858, separated the populations of the Aru Islands as *assimilis* (later rebaptized *ultramontanus* by Stresemann in 1923); Tristram, 1889, the D'Entrecasteaux populations as *propinquus*; Hartert, 1898, the Louisiade populations as *dejectus*; and Neumann, 1922, the populations from the region of Astrolabe Bay as *stellatus*.

Dicrurus h. propinquus was separated on the shape of the spangles, *dejectus* on the basis of measurements and the presence of gloss on the back, *stellatus* on the presence of spangles on the back, *ultramontanus* on measurements.

In table 6 and in the list of individual measurements it is at once apparent that *D. h. carbonarius* exhibits the same amount of geographical variability that has been described by Mayr for other New Guinea birds, such as *Podargus papuensis* (1937a) and *Cacatua galerita triton* (1937b). As might be expected, this is particularly true in the case of the island populations, but to a lesser extent this also applies to the mainland populations.

In all these cases my topotypical populations (D'Entrecasteaux for *propinquus*, Tagula for *dejectus*, Astrolabe Bay for *stellatus*, and Aru for *ultramontanus*) are slightly different from topotypical *carbonarius* (Onin Peninsula), but there is no single measurement that is not bridged by intermediate populations, and furthermore there are many additional populations which are equally distinct, such as those of Numfor, Biak, Kofiau (Salvadori, 1881, p. 180), as well as others.

Taking the wing measurement of adult males as an illustration, I find that small and large populations are scattered everywhere over the whole of New Guinea and on the islands. Small populations are found on Aru, Biak, Misol, Kaileuna in the Trobriands, lower Fly River, and in the Louisiades; large

populations on Waigau, Milne Bay, Huon Peninsula, western New Guinea, Kitava in the Trobriands, and Fergusson in the D'Entrecasteaux.

In view of the intergradation in measurements, the wide variability, and the fact that this variation is irregular, as in *Cacatua* and *Podargus*, and follows no particular geographical pattern which could result in a clear-cut separation, I think that neither *dejectus* nor *ultramontanus* should be separated from all the other populations of *carbonarius*.

mainland New Guinea and those of the D'Entrecasteaux Archipelago. The series from the mainland of New Guinea consists of 74 males and 50 females, the one from D'Entrecasteaux of 27 males and 13 females, all the specimens from both series being fully adult.

The shape of the spangles also follows no particular geographical distribution but seems to be associated with sex. The figures show that a larger percentage of females have rounded spangles, while the reverse is true of the males.

TABLE 7

VARIATION IN THE SHAPE OF THE THROAT AND BREAST SPANGLES IN *D. h. carbonarius*
FROM MAINLAND NEW GUINEA AND THE D'ENTRECASTEAUX ARCHIPELAGO

Shape of Spangles	New Guinea		D'Entrecasteaux	
	N	Per Cent	N	Per Cent
Lanceolated	♂ 41	55.40	♂ 16	59.30
	♀ 20	40.00	♀ 3	23.70
Rounded	♂ 8	10.00	♂ 7	14.80
	♀ 14	28.00	♀ 4	30.70
Intermediate	♂ 25	33.70	♂ 7	29.60
	♀ 16	32.00	♀ 6	46.10

After completing this study, I found that Junge (1939, p. 63) had already reached the conclusion that the birds from various parts of New Guinea could not be separated by measurements. Using the measurements of a large series from the southern slopes of the Snow Mountains, a region from which I had no specimens, he found that, although his birds did "average a trifle smaller," the published measurements of other series from widely separated parts of New Guinea, the islands of Geelvink Bay, and the Arus fell "entirely within the variation range of birds from the southern slope of the Snow Mountains."

Tristram, 1889, separated the D'Entrecasteaux populations as *propinquus* on the basis of narrow and elongated (=lanceolated) spangles on the breast, as opposed to rounded spangles in *carbonarius*. The above table (table 7) shows that both types occur in about the same proportions in the populations of

The Tagula population in the Louisiades was separated by Hartert as *dejectus* on the basis of smaller size (discussed above) and on the back's being more glossy. That of Astrolabe Bay was separated by Neumann as *stellatus* on the basis of having more distinctly developed spangles on the back as opposed to "lacking" or "weakly shown" in *carbonarius*. Examination of our material, which includes the type and paratypes of *dejectus* as well as much additional material from Tagula, shows that there is no difference in regard to these characters between different parts of the range. The Tagula population may on the whole be slightly more glossy, but many mainland birds show just as much gloss. The true spangles are not more distinctly developed in birds from Astrolabe Bay, and they are always lacking on the back. The mantle in all the races of *hottentottus* is dull or velvety and in a few forms irregularly shot with metallic reflections. These

reflections vary as to the freshness of the plumage and are never defined into the true spangles of the upper breast and crown.

On the basis of gloss and the shape and distribution of spangles, *propinquus*, *dejectus*, and *stellatus* cannot therefore be separated from all other populations of *carbonarius*.

A character that all authors use very extensively throughout the family is the color of the gloss. I believe it to be valid only if it shows itself to be constant in a series of specimens in equal state of plumage. In making use of it one should be very cautious because age and wear affect it, and also because its geographical variability is apt to be irregular, as shown by our large series of *carbonarius*.

In this form, generally speaking, the velvety black of the back has a rich, dark purplish-ultramarine tone which also extends to the tail and plays over the metallic gloss of the wings and spangles. But the series also shows that the blue will vary into green by all kinds of subtle gradations. To express this variation in numerical terms and to see whether any geographical trend was discernible, I used Mayr's method (1936b, p. 13, or 1944b). All the adult males from the western Papuan islands and New Guinea were combined in one series and arranged according to the color of the gloss. The bluest bird was placed first, the greenest last. The specimens then ranked as follows:

- A. Eastern New Guinea, northern coast: 3, 4, 10, 19, 22, 47, 53, 67 (28.12)
- B. Western Papuan islands and western New Guinea: 1, 5, 6, 7, 8, 17, 21, 26, 28, 31, 33, 34, 36, 37, 42, 44, 46, 48, 49, 63 (29.10)
- C. Eastern New Guinea, Milne Bay area: 18, 20, 39, 51 (32.0)
- D. Upper Fly River: 11, 13, 15, 23, 24, 25, 50, 56, 58, 72 (34.70)
- E. Northern New Guinea and Bernhard Camp: 2, 9, 12, 14, 16, 29, 30, 32, 40, 41, 43, 52, 55, 61, 62, 64, 65, 68, 73, 74, 75 (43.67)
- F. Eastern New Guinea, southern coast: 27, 38, 45, 69 (44.75)
- G. Huon Peninsula: 35, 59, 71 (55.0)
- H. Lower Fly River: 54, 57, 60, 66, 70 (61.40)

Although the number of specimens is not the same in each population, it can nevertheless be seen that, as in the case of measurements, if the populations are listed in a

geographical sequence from west to east, the variation from blue to green is irregular and follows no particular geographical trend:

2. B. Western Papuan islands and western New Guinea
5. E. Northern New Guinea and Bernhard Camp
4. D. Upper Fly River
8. H. Lower Fly River
7. G. Huon Peninsula
1. A. Eastern New Guinea, northern coast
6. F. Eastern New Guinea, southern coast
3. C. Eastern New Guinea, Milne Bay area

The same lack of geographical pattern is shown by the female series and those of the island populations of Aru, the Trobriands, D'Entrecasteaux, and the Louisiades.

It is interesting to note that, although the color of the gloss follows no particular geographical pattern, the bluest populations (1, 2, 3, and 4) are generally found in the more humid regions and the greenest (6 and 8) in the driest. The birds from the Huon Peninsula stand at 7 and seem to contradict this trend but, being only three oldish specimens, should be disregarded.

I have shown the wide intergradation in measurements and the variability in the shape of the spangles and in the color of the gloss. In no character can a geographical pattern be discernible. Under the circumstances it seems best to apply the name *carbonarius* to all the listed populations and to consider *propinquus*, *dejectus*, *stellatus*, and *ultramontanus* as synonyms of it.

Dicrurus hottentottus bracteatus Gould

Dicrurus bracteatus GOULD, 1842, Proc. Zool. Soc. London, p. 132. Eastern and northern coasts of Australia.

Dicrurus bracteatus baileyi MATHEWS, 1912, Novitates Zool., vol. 18, p. 437. Alligator River, Northern Territory. (Type in A.M.N.H.)

Resembles *carbonarius* but with a slightly longer wing. Bill a little more robust and slightly longer. The frontal feathers somewhat less dense and shorter, leaving a little more of the length of the culmen exposed. General color duller, less bluish, more blackish, and with the gloss strongly greenish rather than purplish blue.

Immatures are duller and browner and have more abundant white tips to the axillaries than the immatures of the other races

of *hottentottus*; in addition they are also often barred below with white or buffy, and have small white feathers along the inner bend of the wing as in the immatures of super-species *adsimilis*.

SPECIMENS EXAMINED: New Guinea: south-western Papua: Daru, 1 ad. ♂, 2 imm. ♀, 1 unsexed ad., 1 unsexed imm.; Bugi, 1 ad. ♀; Gaima, east bank of the lower Fly River, 5 imm. ♂, 3 imm. ♀.

Queensland: Cape York region: Cape York, 1 ad. ♂, 1 unsexed ad.; Cable station, 2 imm. ♀, 2 imm. ♀ (?); Patison Creek, 1 imm. ♂, 1 imm. ♀; Lockabie, 1 ad. ♂; Somerset, 1 imm. ♂, 2 imm. ♀; Utingu, 5 ad. ♂, 2 imm. ♂, 5 imm. ♂ (?), 1 ad. ♀, 1 ad. ♀ (?), 3 imm. ♀. Northern Queensland: Atherton, 1 ad. ♂, 1 imm. ♀; Normanton, 1 imm. ♀; Johnstone River, 1 ad. ♀, Cooktown, 3 imm. ♂, 4 ad. ♀; Tully River, 1 imm. ♀; Allumbah, 2 ad. ♂, 1 imm. ♀; Mt. Sapphire, 1 ad. ♂; Cairns, 1 ad. ♂, 1 ad. ♀, 2 unsexed ad., 2 unsexed imm.; Geraldton, 1 imm. ♂; Inkerman, 1 imm. ♂, 1 unsexed imm.; Mackay, 1 unsexed ad.; Cardwell, 1 ad. ♂; Moreton Bay, 1 ad. ♀. Great Barrier Reef, 1 unsexed ad. Queensland, no locality, 1 ad. ♂.

New South Wales: Richmond River, 1 unsexed ad.

Northern Territory: Arnhem Land, southern Alligator River, 1 ad. ♂ (the type of *D. b. baileyi*), 3 ad. ♂, 2 ad. ♀ (the paratypes of *D. b. baileyi*). McKinley River, 1 ad. ♂; Burundie, 1 ad. ♀; Port Darwin, 2 ad. ♂; Daly River, 1 ad. ♀.

Melville Island: "10 miles east of Gordon Point," 6 ad. ♂, 2 ad. ♀; Apsley's Straits, Cooper's Camp, 5 ad. ♂, 1 imm. ♂, 2 ad. ♀, 3 nestlings (2 ♂, 1 ♀).

North Western Australia: Admiralty Gulf, 1 ad. ♂.

MEASUREMENTS: Length of bill, male, 22.0–25.0 (23.59); female, 21.0–25.0 (23.07). Wing, male, 152.0–167.0 (160.45); female, 151.0–167.0 (158.14). O.T.F., male, 125.0–136.0 (130.0); female, 125.0–134.0 (128.76). C.T.F., male, 109.0–126.0 (115.84); female, 112.0–121.0 (115.73). Depth of fork (average), male, 14.16; female, 13.03.

RANGE: The northern and eastern coasts of Australia down to northern Victoria (Barrett); accidental visitor in Tasmania (Barrett). Migrates to southern New Guinea.

DISCUSSION: The presence of this form in Victoria, where a specimen was collected at Lakes Entrance, is reported by Barrett (1926) who also mentions that it is an accidental visitor in Tasmania.

Mathews separated the birds from the Northern Territory as *baileyi* with the brief statement, "Differs from *D. b. bracteatus* in its larger wing—161 mm." A series from Northern Territory, including the type and paratypes of *baileyi* as well as additional material, shows that in adult males the wing measures: 157, 160, 161, 161, 161.5, 165, 167 (162.21). A series of adult males from northern Queensland measures: 155, 158.5, 160.5, 162.5, 163, 163, 164, 164, 164.5, 165, 165.5, 166, 167 (162.96). The two series are identical, and *baileyi* was later made synonymous by its author (Mathews, 1930).

The birds of Melville Island, on the other hand, average definitely smaller. In a series of adult males the wing measures: 152, 155, 156.5, 157, 157, 157.5, 158, 158, 159, 161 (157.10); and the bill: 22, 22, 22, 22, 22, 22.8, 23, 23, 23, 24, 24 (22.71). In the Queensland series, whose wing measurement is given above, the bill measures: 22, 23.5, 23.5, 24, 24, 24, 24, 24.2, 24.5, 24.5, 24.5, 25, 25 (24.05). The same trend is shown by the series of adult females. Although the differences are not great, they might be considered distinct enough to warrant recognizing a smaller insular race, if it were not for the fact that our adequate series of measurements show such a great deal of overlap.

The specimens from southern New Guinea included in this study were discussed by Rand (1938, p. 2). The adult female collected at Bugi on January 3 had enlarged gonads, and since *bracteatus* breeds in Queensland from October to January it is possible, as Rand says, that the Bugi specimen may have been breeding "within the range of *carbonarius* . . . so that *bracteatus* must be considered a separate species." However, the whole evidence rests on this single specimen only, since none of the others was in breeding condition. There has been a fair amount of collecting in southern New Guinea, and no other *bracteatus* has been found in breeding condition. Under the circumstances it seems best at this time (until others can actually be found breeding there) to treat this specimen as an isolated case.

So far the overwhelming evidence is that *bracteatus* occurs only as a migrant in southern New Guinea. Rand says that "In November, at Gaima, drongos were common, and the

actions of many of them strongly indicated that they were migrating . . . They all appeared to be moving toward the southeast; that is, parallel to the river, as though working down to the end of the point of land between the Fly and the Bamu before crossing to Australia." He also cites Barnard (1911, p. 29) as having recorded it at Cape York "as very common and migratory, coming from New Guinea in large numbers in October." The specimens recorded by Salvadori (1881) from 150 to 200 miles up the Fly River were all collected from the 11th to the 16th of June, and could, in the light of Rand's observation of the movement down that river, be also migrants from Australia.

Mayr (1944c) posed the question whether *bracteatus* came to Australia via Timor or Cape York. As is mentioned later in the discussion of *megalornis*, this revision shows very conclusively that *bracteatus*, rather than having been derived from Timor and then expanded secondarily to New Guinea, came instead from New Guinea via Cape York. The bird of Timor (*densus*) is very different from *bracteatus*, whereas the similarity between *carbonarius* and *bracteatus* is still close.

Dicrurus hottentottus laemostictus Sclater

Dicrurus laemostictus SCLATER, 1877. Proc. Zool. Soc. London, p. 101. New Britain.

Similar to *carbonarius* in every measurement, but glossier, the metallic feathers of the crown being a little larger, the spangles a little more abundant and generally larger, and the hackles very well defined, considerably longer and glossier.

SPECIMENS EXAMINED: Rook Island: 1 ad. ♂, 3 ad. ♀, 2 imm. ♀. New Britain: no locality, 1 ad. ♂, 4 unsexed ad.; Talasea, 5 ad. ♂, 1 ad. ♀, 1 ad. ♀ (?), 1 imm. ♀. Nakanai Mts.; Lobi, "3-5000 feet," 2 ad. ♂, 1 ad. ♀; Malutu, "2750-3000 feet," 4 ad. ♂, 3 ad. ♀. Bainings Valley, 9 ad. ♂, 2 imm. ♂, 6 ad. ♀, 1 imm. ♀; Blanche Bay, 1 ad. ♂, 1 ad. ♀; Rabaul, 2 ad. ♀.

MEASUREMENTS: Length of bill, male, 20.5-25.0 (22.72); female, 20.5-23.5 (22.0). Wing, male, 141.0-159.0 (151.0); female, 139.0-152.0 (146.30). O.T.F., male, 128.0-147.0 (136.50); female, 125.0-141.0 (131.77). C.T.F., male, 110.0-124.0 (115.60); female, 106.0-122.0 (114.30). Depth of fork (average), male, 20.90; female, 17.47.

RANGE: New Britain and Rook Island.

DISCUSSION: The fairly long and very glossy hackles, the larger spangles, and the larger feathers of the crown render this form glossier in appearance than its neighbors. Sclater thought that in *laemostictus* the spangles were "quite as large and well marked as in *D. pectoralis*, and extend moreover over the throat." A comparison of our specimens shows rather the opposite. Although the spangles are very definitely larger in *laemostictus* than in its neighboring forms, they are smaller and distinctly do not extend so high over the throat as in *pectoralis*, a form which belongs to an entirely different dispersory wave of the species.

The specimens from Rook Island average a little larger in all their measurements than those of New Britain, but not sufficiently so to justify subspecific separation.

Dicrurus megarhynchus Quoy and Gaimard
NEW IRELAND DRONGO

Edolius megarhynchus QUOY AND GAIMARD, 1830, Voyage "Astrolabe," Zool. 1, p. 184, Atlas Ois., pl. 6. "Dorey, New Guinea," error for Port Praslin, New Ireland.

Edolius intermedius LESSON, 1831, Traité d'ornithologie, p. 380 (not *Dicrurus intermedius* Blyth, 1846). "Des Moluques," error for New Ireland.

With the striking exception of the tail, resembles very closely its neighboring forms, but decidedly larger throughout, a little duller, and with the spangles more reduced. The outer tail feathers enormously prolonged and fully webbed to their tips, and with the distal third or quarter of the shaft twisting in a long spiral (fig. 2, no. 1).

SPECIMENS EXAMINED: Southern New Ireland, 4 ad. ♂, 3 ad. ♂ [?], 1 imm. ♂, 6 ad. ♀, 1 imm. ♀, 4 unsexed ad. Northern New Ireland, Nusa Island, 1 ad. ♂.

MEASUREMENTS: Length of bill, male, 26.0-27.0 (26.25); female, 25.0-27.8 (26.68). Wing, male, 182.0-186.0 (183.75); female, 170.0-180.0 (175.60). O.T.F., male, 375.0-390.0 (384.50); female, 326.0-398.0 (359.40). C.T.F., male, 149.0-158.0 (154.10); female, 140.0-158.0 (148.40). Difference between O.T.F. and C.T.F. averages: male, 230.40; female, 211.0.

RANGE: Restricted to New Ireland.

DISCUSSION: The reasons for not considering *D. megarhynchus* to be generically distinct from *Dicrurus* were given in the general discussion of the genera.

No character other than the great length of the outer tail feathers separates this form from the other members in group A of *D. hottentottus*, but since this character has developed to such an extent the reproductive isolation of *megarhynchus* must be suspected. Accordingly, I do not make it conspecific with *hottentottus*, although I certainly consider it to belong to the same superspecies. Since *megarhynchus* is merely the representative form of *hottentottus* from which it was very clearly derived, the New Ireland populations appear to have originally arrived, via New Britain, as part of the same wave that invaded New Guinea.

***Dicrurus hottentottus meeki* Rothschild and Hartert**

Dicrurus meeki ROTHSCHILD AND HARTERT, 1901, *Novitates Zool.*, vol. 10, p. 110. "Guadalcanar," Solomon Islands. (Type in A.M.N.H.)

Similar in size to *carbonarius* but with a much less forked tail, the feathers of which do not curve upward at their tips. Throat and breast spangles much fewer and very small, but the metallic feathers of the crown large as in *laemostictus*. Neck hackles short and very poorly glossed. Bill similar, including the feathering, to that of *carbonarius*, but with the rictal bristles more developed, longer, and very strong.

SPECIMENS EXAMINED: Southeastern Solomon Islands, Guadalcanal, 1 ad. ♂ (the type of *D. meeki*), 1 ad. ♂, 1 ad. ♀ (the paratypes of *D. meeki*).

MEASUREMENTS: Length of bill, male, 23.0, 23.8 (23.40); female, 21.0. Wing, male, 152.0, 152.0; female, 146.0. O.T.F., male, 131.0, 137.5 (134.25); female, 133.0. C.T.F., male, 123.0, 124.0; female, 122.0. Depth of fork (average), male, 10.75; female, 11.0.

RANGE: Restricted to Guadalcanal Island in the Solomon Archipelago.

DISCUSSION: The distribution of *hottentottus* in the Solomons, where the bird is lacking entirely northwest of Guadalcanal, suggests that the two forms found at the eastern end of the archipelago (*meeki* in Guadalcanal and

longirostris in San Cristobal) originally arrived not by way of New Britain but probably from New Guinea by way of the Louisiades.

***Dicrurus hottentottus longirostris* Ramsay**

Dicrurus (Chibia) longirostris RAMSAY, 1882, *Proc. Linnean Soc. New South Wales*, vol. 7, p. 300. Wano, San Christoval [Solomon Islands].

Differs from *carbonarius*, as well as from all other races of *hottentottus*, by the greater length of its bill. The bill of *longirostris* is much longer and somewhat straighter, but is otherwise of the same type as that of the races of the southern Moluccas (*manumeten*, *amboinensis*, and *buruensis*), that is, strongly compressed laterally, lacking the curved frontal feathers, and having the rictal bristles short and very weak. In *longirostris*, as well as in the three races from the southern Moluccas, the frontal feathers are not developed, and being very short expose virtually the whole length of the culmen, and barely reaching the nostril, leave it exposed in most of the specimens.

Also, in *longirostris* the tail is flat and almost straight as in the races from the southeastern Philippines (*samarensis* and *striatus*) and like them, being scarcely forked, is squarish in shape.

SPECIMENS EXAMINED: San Cristobal: 7 ad. ♂, 2 imm. ♂, 4 ad. ♀; Yanuto, 1 ad. ♂, 2 ad. ♀; Makira, 1 imm. ♂; "1900 feet," no locality, 1 ad. ♂, 4 imm. ♂, 4 ad. ♀, 5 imm. ♀.

MEASUREMENTS: Length of bill, male, 29.0–33.5 (31.80); female, 27.0–30.0 (28.83). Wing, male, 143.5–154.0 (148.70); female, 137.0–148.0 (142.55). O.T.F., male, 128.0–137.5 (132.75); female, 124.5–133.0 (128.22). C.T.F., male, 119.0–131.0 (126.10); female, 117.0–127.0 (121.95). "Depth of fork" (average), male, 6.65; female, 6.27.

RANGE: Restricted to San Cristobal Island in the Solomon Archipelago.

***Dicrurus montanus* Riley**

CELEBES MOUNTAIN DRONGO

Dicruropsis montana RILEY, 1919, *Proc. Biol. Soc. Washington*, vol. 32, p. 94. Besoa, Toewo Mountains, north central Celebes. (Type in U.S.N.M.)

This form resembles neighboring *atrocaerus*

leus of Halmahera in every way but is considerably smaller and has the tail more deeply forked. From *leucops*, with which it is found, it differs in every character. It is smaller, the bill and feet being especially smaller. It is duller and the hackles are shorter, much narrower, and much less glossy, the breast spangles much fewer, much smaller, and much less glossy. The frontal feathers, identical with those of *atrocaeruleus*, are much longer and better developed. The frontal filaments found in some specimens of *leucops* are completely lacking. The wing linings are a little paler. The tail is of the same length as that of *leucops*, but is more deeply forked, and the tips of the outer rectrices do not curl so much. The color of the iris in *montanus* is indicated as being "brown" or "dark brown" instead of white as in *leucops*.

SPECIMENS EXAMINED: Central Celebes: Toewo Mts., Besoa, 1 ad. ♂ (the type of *D. montanus*); Latimodjong Mts., "1600 meters," 1 ad. ♂, 1 imm. ♂, 1 ad. ♀. Northern peninsula: Rurukan, "1000 meters," 1 ad. ♀; Paleleh, 1 imm. ♂; Ile Ile, "800 meters," 1 ad. ♂, 1 imm. ♂, 1 ad. ♀; Matinan Mts., "600 meters," 1 ad. ♂, 2 imm. ♂, 1 ad. ♀, 1 imm. ♀. Southeastern peninsula: Minongkoka Mts., Masembo, "550 meters," 1 ad. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 17.5–23.0 (19.90); female, 18.5–20.0 (19.12). Wing, male, 131.0–144.0 (140.0); female, 133.0–141.5 (138.37). O.T.F., male, 135.0–150.0 (140.32); female, 145.0–147.0 (146.0). C.T.F., male, 102.0–113.0 (105.40); female, 110.0–113.0 (111.0). Depth of fork (average), male, 34.98; female, 35.0.

RANGE: Mountains of Celebes.

DISCUSSION: Except for the size difference, *montanus* is identical with *atrocaeruleus* and would most certainly have been regarded as only racially distinct, were it not for the fact that it has been found in the same localities with another race of *hottentottus*, in this case *leucops*. *D. montanus* seems, however, to be confined to the mountains, for all of my specimens as well as those of Stresemann (1940) were collected at altitudes ranging from 550 to 1800 meters. *D. h. leucops*, on the other hand, is found mostly in the lowlands and around the coasts and surrounding islands, but since it also occurs in the same localities as *montanus* and is also

occasionally found in the mountains, the two forms must apparently be reproductively isolated. I have specimens of both forms from Paleleh, and Stresemann (1940) had both from Rurukan, *montanus* at 1000 meters and *leucops* at 800; I also have a specimen of *leucops* collected at 3000 feet on Mt. Massarang, all these localities being in the northern peninsula.

Even though both forms now associate as good species, they obviously have had a common origin, and their presence in Celebes very evidently represents two separate invasions. The older one gave rise to *montanus* and may have been the original wave of expansion from the southeastern Philippines which arrived either directly or by way of Halmahera, the great similarity of characters between *montanus* and *atrocaeruleus* showing that the two are closely related. The younger invasion arriving as wave C gave rise to *leucops*, the time interval between the two invasions of Celebes being apparently sufficiently long to permit the development of reproductive isolation.

***Dicrurus hottentottus manumeten* Stresemann**

Dicrurus hottentottus manumeten STRESEMANN, 1914, *Novitates Zool.*, vol. 21, p. 148. Manusela, Ceram. (Type in A.M.N.H.)

Differs from neighboring *atrocaeruleus* by being much smaller. Duller, less bluish, more dull blue black, the throat and breast spangles being fewer and very much smaller. Neck hackles poorly developed and very poorly glossed. Bill very much shorter than that of *longirostris* but of the same type, that is, slender and strongly compressed laterally, lacking the curved frontal feathers, and with very weak rictal bristles. Tail moderately long and moderately forked, the outer rectrices curving outward and turning upward at their tips.

SPECIMENS EXAMINED: Ceram: Manusela, 1 subad. ♂ (the type of *D. h. manumeten*), 1 ad. ♀, 1 imm. ♀; Wahai, 2 ad. ♂, 1 ad. ♀ (the paratypes of *D. h. manumeten*).

MEASUREMENTS: Length of bill, male, 23.0, 23.0; female, 21.5, 23.5 (22.50). Wing, male, 141.0, 141.0; female, 133.0, 134.0. O.T.F., male, 123.0, 128.0 (125.50); female, 117.0, 121.0 (119.0). C.T.F., male, 99.0, 108.0 (103.50); female, 94.0, 102.5 (98.25). Depth

of fork (average), male, 22.0; female, 20.75.

RANGE: Ceram and "Haruku?, Saparua?" (Stresemann).

DISCUSSION: Stresemann cites the wing measurements of Vorderman for a series of adult females from Saparua as being: 128, 130, 132, 133, 134, 141.5 (133.13), and the wing measurement of an unsexed adult from Haruku as 135. These measurements are too small for *amboinensis* in which the wing measures, in four adult males: 147, 149, 150, 152 (149.50), and 144 in an adult female. As the measurements of the Saparua and Haruku specimens agree with those of topotypical *manumeten*, the birds of these two islands appear to belong to the Ceram race.

It is interesting to note that in the southern Moluccas and in the southeastern Solomons some of the characters have followed a similar development. In the three races from the southern Moluccas (*manumeten*, *amboinensis*, and *buruensis*) and in *longirostris* from San Cristobal in the Solomons, the bill has become modified from a heavier, broader, not compressed and more highly arched type, to a slender, more pointed, and strongly compressed type. There are differences in the bill among these four races, but except for length, they are very slight. In all four, also, the feathering at the base of the bill is identical, the curved frontal feathers having become completely lost and the rictal bristles very short and weak.

The other form from the Solomons, *meeki*, from Guadalcanal, retains a bill identical in shape and with the same type of feathering as in the races of subdivisions a and b. Like them, also, its rictal bristles are very well developed and are in fact the longest and strongest of all the forms in the superspecies. But in other characters, such as the hackles and breast spangles, *meeki* is similar to *manumeten* and *amboinensis*. The hackles are very short and hardly glossed and the breast spangles very few and very small, the ornamental characters of the superspecies being least developed in these three forms. The breast spangles and hackles in *longirostris* and *buruensis* are similar to those in the races of subdivision b of group A.

Dicrurus hottentottus amboinensis Gray

Dicrurus amboinensis GRAY, 1860, Proc. Zool.

Soc. London, p. 354. "Amboyna." (Type in British Mus.)

Similar to *manumeten* but with a longer wing and tail.

SPECIMENS EXAMINED: Amboina: 4 ad. ♂, 1 imm. ♂, 1 ad. ♀, 2 imm. ♀.

MEASUREMENTS: Length of bill, male, 22.5–24.5 (23.37); female, 22.50. Wing, male, 147.0–152.0 (149.50); female, 144.0. O.T.F., male, 135.0–141.0 (137.50); female, 135.0. C.T.F., male, 113.5–117.0 (115.50); female, 112.0. Depth of fork (average), male, 22.0; female, 23.0.

RANGE: Amboina Island.

Dicrurus hottentottus buruensis Hartert

Dicrurus (bracteatus?) buruensis HARTERT, 1919, Novitates Zool., vol. 26, p. 133. "Mount Madang," west Buru. (Type in A.M.N.H.)

Bill slightly more arched but of the same compressed type and with the same feathering as in *manumeten* and *amboinensis*. Length of the wing, and especially that of the tail, considerably larger than in either of these two races. These measurements are virtually identical with those of the form found on Timor (*densus*), both *buruensis* and *densus* having the same type of long and deeply forked tail, the tail length in both being greater than that of the wing. Breast spangles like those of *densus*, that is, much larger, much more abundant, and glossier than in *manumeten* and *amboinensis*. Differs from these two and from *densus* by the general coloration which in *buruensis* is purplish blue rather than dull blue black, and by the reflections of the gloss which are duller in *manumeten* and *amboinensis* and more greenish in *densus*. Differs also from these three by the mantle, which, instead of being as dull or velvety, is invaded by a few metallic reflections. The color of the iris in *buruensis* is given as "coffee brown."

SPECIMENS EXAMINED: Buru: Mt. Madang, 1 ad. ♂ (the type of *D. buruensis*), 2 ad. ♂, 1 imm. ♂, 2 imm. ♀ (the paratypes of *D. buruensis*); Fogi, 1 ad. ♂, 1 imm. ♂; Tifu, 1 imm. ♂; Kayeli, 2 imm. ♂, 1 ad. ♀, 1 unsexed ad.; "NE Buru," 1 ad. ♂; no locality, 1 ad. ♂.

MEASUREMENTS: Length of bill, male, 23.5–24.5 (24.0); female, 23.0. Wing, male, 151.5–156.0 (154.62); female, moulting.

O.T.F., male, 163.0–174.0 (168.66); female, 163.0. C.T.F., male, 125.0–128.0 (126.62); female, 125.5. Depth of fork (average), male, 42.04; female, 37.50.

RANGE: Buru Island.

DISCUSSION: This form connects the other two southern Moluccan races (*manumeten* and *amboinensis*) to the form found on Timor (*densus*), having, as is apparent in the description, some of its characters in common with both.

GROUP B

This group is made up of seven races which I consider to have originated from a secondary wave of expansion from the Moluccas which I have called wave B. As mentioned

intergrade very well with each other.

The eastern branch consists of three races: *densus* in Wetar, Timor, and Sermata; from there this branch follows the islands of the Outer Banda Arc and separates itself into *kühni* in the Tenimbers; and *megalornis* in the Keis, Watubelas, and the Gorong Islands. The western branch is made up of four races: starting with *sumbae* in Sumba it proceeds to Flores, Pantar, and Alor as well as to Lombok (*bimaënsis*), and to Sumbawa (*renschii*); the Lombok population is slightly different from that of Flores, Pantar, and Alor but the two cannot be separated. The terminal race of this western branch is found in Sumatra with *sumatranus*. Today this race has become completely isolated from the

TABLE 8

COMPARATIVE MEASUREMENTS OF ADULT MALES IN THE RACES OF *D. hottentottus* FORMING GROUP B, AND OF *D. h. buruensis* FROM GROUP A

Race	N	Length of O.T.F.	Depth of Fork	Length of Bill ^a	Depth of Bill	Length of Wing
<i>D. h. buruensis</i>	6	163.0–174.0 (168.66)	42.04	23.5–24.5 (24.00)	11.86	151.5–156.0 (154.62)
<i>D. h. densus</i>	5	173.0–181.0 (176.81)	49.10	24.5–26.0 (25.10)	13.88	154.0–158.0 (155.80)
<i>D. h. kühn^b</i>	4	150.0–158.0 (155.50)	32.00	24.0–25.5 (24.75)	14.70	150.0–161.0 (156.50)
<i>D. h. megalornis</i>	4	168.0–179.5 (176.25)	25.38	26.0–28.0 (27.12)	15.46	168.0–179.5 (175.37)
<i>D. h. sumbae</i>	7	136.0–151.0 (142.70)	19.70	22.5–24.0 (23.30)	12.33	143.0–154.0 (146.00)
<i>D. h. bimaënsis^c</i>	7	120.0–127.0 (122.28)	8.93	21.5–23.5 (22.71)	11.44	141.0–147.0 (144.85)
<i>D. h. bimaënsis^d</i>	4	116.0–121.0 (119.25)	11.25	21.5–23.0 (22.00)	11.54	141.0–145.0 (142.75)
<i>D. h. renschii</i>	3	105.0–108.0 (106.66)	10.16	22.0–22.5 (22.16)	11.45	132.5–136.5 (134.66)
<i>D. h. sumatranus^e</i>	4	105.0–109.0 (106.75)	6.75	19.5–22.0 (20.37)	10.35	149.0–153.0 (151.25)

^a The length of the bill is measured from the anterior border of the nostril.

^b Unsexed adults.

^c From Lombok.

^d From Flores, Pantar, and Alor.

^e Unsexed adults.

above, the fact that some of the characters of *buruensis* are similar to those of the birds now found on Wetar and Timor (*densus*) suggests that this wave came down to the Lesser Sundas via Buru.

Today the seven races divide themselves into two very natural subgroups, an eastern and a western one; the two being very distinct from one another further suggests that this separation in wave B probably coincided with its arrival on Wetar and Timor. Geographically, as well as in all characters, the two groups are diametrically opposite to each other, but their common origin is shown by the fact that the two more central races

other three, its way having become cut off by the whole of Bali and Java, in parts of which another race of *hottentottus* now intervenes. This race, *jentincki*, has been derived, however, from an entirely different, and apparently more recent, wave of expansion.

The more central birds in group B are still close to one another, *sumbae* intergrading very well with *densus*, but from there on the evolution of the two branches proceeded along entirely different lines: the birds of the eastern branch getting larger, duller, greener, and less velvety, their bills becoming progressively longer and more massive; those of the western branch getting progressively

smaller, gradually losing the fork, getting glossier, bluer, and more velvety, their bills gradually getting smaller.

It is impossible to give a character for group B as a whole that would distinguish its races from those of group A, also taken as a whole. However, the birds of group B differ from those of group A as follows: in group B the races of the eastern branch all have more massive and more highly arched bills, the races of the western branch are distinctly glossier and bluer, are more velvety, have larger and more abundant breast spangles, longer and glossier hackles, and in two of the races (*bimaënsis* and *renschii*) the tips of the outer rectrices curl more strongly upward.

Table 8 summarizes the more significant measurements of the races of group B. The measurements are those of only fully adult males, except in the cases of *kühni* (one male, three females) and *sumatranus* (two males, two females). The measurements of *buruensis* from group A are given at the head for comparison. As the two populations of *bimaënsis* differ slightly, they are listed separately, a refers to the birds of Lombok, b to those of Flores, Pantar, and Alor. The depth of the bill is taken at the level of the nostril and is that of all the specimens.

Dicrurus hottentottus densus Bonaparte

Edolius densus BONAPARTE, 1850, Conspectus generum avium, vol. 1, p. 352. Timor.

Similar in measurements and with the same type of long and deeply forked tail as *buruensis*, but with the bill of an entirely different type. The bill in *densus* is considerably thicker, heavier, and being more highly arched, ends in a stronger downward curve. The feathers at the base of the bill are much more developed, extending farther forward over the culmen. General coloration dull blue black, reflections of the gloss dull greenish. Neck hackles long. Mantle entirely dull.

SPECIMENS EXAMINED: Sermata Islands: Loeang Island, 1 imm. ♂. Wetar Island: 3 ad. ♂, 1 imm. ♂, 2 ad. ♀, 1 imm. ♀. Timor: Atapupu, 2 ad. ♂, 3 ad. ♀; Tjamplong, 1 subad. ♂, 2 imm. ♀; Nenas, 1 subad. ♂, 1 subad. ♀; Noilmina, 1 subad. ♀.

MEASUREMENTS: Length of bill, male, 24.5–26.0 (25.10); female, 23.5–25.0 (24.50). Wing, male, 154.0–158.0 (155.80); female,

149.5–154.0 (152.0). O.T.F., male, 173.0–181.0 (176.81); female, 164.0–172.0 (168.25). C.T.F., male, 125.0–129.0 (127.0); female, 121.0–130.0 (125.75). Depth of fork (average), male, 49.10; female, 42.50.

RANGE: Timor, Wetar, and Sermata Islands.

Dicrurus hottentottus kühni Hartert

Dicrurus kühni HARTERT, 1901, Novitates Zool., vol. 8, p. 170. Larat, Timorlaut [Tenimber] Islands. (Type in A.M.N.H.)

Differs from *densus* in having a shorter and less deeply forked tail, and by having the bill a little more compressed but still more highly arched. The glossy feathers of the crown extending farther back. More or less abundant, ill-defined, glossy reflections spread from the hind neck onto the mantle. Gloss dull greenish as in *densus*.

SPECIMENS EXAMINED: Tenimber Islands, Larat Island, 1 ad. ♂ (the type of *D. kühni*), 1 ad. ♀ (the cotype of *D. kühni*), 1 imm. ♂, 2 ad. ♀, 1 imm. ♀ (the paratypes of *D. kühni*).

MEASUREMENTS: Length of bill, male, 25.0; female, 24.0–25.0 (24.50). Wing, male, 161.0; female, 150.0–158.0 (154.66). O.T.F., male, 158.0; female, 150.0–158.0 (154.66). C.T.F., male, 132.0; female, 127.5–135.0 (131.25). Depth of fork (average), male, 26.0; female, 23.41.

RANGE: The Tenimber Islands.

Dicrurus hottentottus megalornis Gray

Dicrurus megalornis GRAY, 1858, Proc. Zool. Soc. London, p. 179. Kei Island.

Similar to *kühni* but larger. Gloss similar but with no, or very much fewer, metallic reflections on the mantle. Bill still heavier and thicker than that of *kühni* but less arched.

SPECIMENS EXAMINED: Kei Archipelago: Doelah Kei, Toel, 3 ad. ♂, 2 ad. ♀, 1 imm. ♀. Great Kei: Ad, 1 imm. ♂; no locality, 2 unsexed ad. Koer Island, 1 imm. ♂.

Watubela Islands: Tioör Island, 1 ad. ♂, 2 ad. ♀. Kasioei Island, 2 imm. ♂, 2 imm. ♀.

Gorong Islands: Manawoka Island, 1 imm. ♀. Gorong Island, Ondor, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 26.0–28.0 (27.12); female, 25.0–26.5 (25.87). Wing, male, 168.0–179.5 (175.37); female, 162.5–168.0 (164.37). O.T.F., male, 168.0–183.0 (176.25); female, 163.0–170.0 (164.75).

C.T.F., male, 146.0–153.0 (150.87); female, 135.0–145.0 (140.50). Depth of fork (average), male, 25.38; female, 23.87.

RANGE: The Kei, Watubela, and Gorong Islands.

DISCUSSION: Hartert (1901), in his discussion of *kühni*, has shown, and my findings fully agree, that this bird and the members of its group, instead of being closely allied to *bracteatus* as was formerly thought, actually differ widely from it. There is no direct connection between *bracteatus* and the *densus-kühni-megalornis* group. The connection is very remote, as *bracteatus* apparently reached Australia as part of a different wave of expansion which came by way of New Guinea and Cape York rather than by way of Timor or the Tenimbers.

It is also interesting to note that the birds of the Gorong Islands are typical *megalornis*, not *manumeten* as on Ceram, despite the very close proximity of these islands to the eastern tip of Ceram. There again, the birds have, as in the case of *bracteatus*, traveled the long way around.

Dicrurus hottentottus sumbae Rensch

Dicrurus hottentottus sumbae RENSCH, 1931, Treubia, vol. 13, p. 382. Karoni and Laora, Sumba Island. (Type in Zool. Mus. Berlin.)

Close to *densus* but smaller in every measurement and with the tail only about half as deeply forked. Bill smaller, more compressed, and not so highly arched. The feathers at its base a little longer and showing a tendency to end in little plumes that curl forward over the culmen and nostril. A little glossier than *densus*, and with slight metallic reflections on the mantle, and generally with more abundant and larger spangles. Neck hackles narrow but well developed. General color and gloss not quite so green, becoming rather strongly bluish in some specimens.

SPECIMENS EXAMINED: Sumba: Mao Maru, 3 ad. ♂, 1 imm. ♂, 2 ad. ♀; Langgaliru, 2 ad. ♂, 1 ad. ♀; Melolo, 1 imm. ♀; no locality, 2 ad. ♂, 1 ad. ♀, 1 unsexed ad.

MEASUREMENTS: Length of bill, male, 22.5–24.0 (23.30); female, 23.0–24.0 (23.37). Wing, male, 143.0–154.0 (146.0); female, 140.0–145.0 (142.25). O.T.F., male, 136.0–151.0 (142.70); female, 138.0–142.0 (140.66).

C.T.F., male, 113.5–144.0 (123.0); female, 115.0–123.0 (118.0). Depth of fork (average), male, 19.70; female, 22.66.

RANGE: Sumba Island.

DISCUSSION: As Rensch remarks in the original description, *sumbae* is the connecting link between the races of the Lesser Sundas [and of Sumatra] to Timor. Of the four races of the western branch of wave B it not only most nearly resembles *densus*, but its characters are intermediate between it and those of the races farther west.

Dicrurus hottentottus bimaënsis Wallace

Dicrurus bimaënsis WALLACE, 1863, Proc. Zool. Soc. London, p. 492. "Lombok, (Sumbawa) Temm., and Flores." Type locality restricted to Flores by Rensch, 1931, Mitteil. Zool. Mus. Berlin, vol. 17, no. 4, p. 589.

Dicrurus hottentottus vicinus RENSCH, 1928, Ornith. Monatsber., vol. 36, p. 7. Ekas, Lombok. (Type in Zool. Mus. Berlin.)

Similar to *sumbae* but a little smaller, particularly the tail which is considerably shorter and has a much shallower fork. The ends of the outer rectrices curl much more upward. The feathers at the base of the bill slightly longer and curling farther forward. Mantle more velvety. Color definitely bluer.

SPECIMENS EXAMINED: Lombok, 7 ad. ♂. Flores, 2 ad. ♂. Pantar, 1 ad. ♂, 1 ad. ♀. Alor, 1 ad. ♂, 1 ad. ♀. Goenoengapi, 1 subad. ♂.

MEASUREMENTS: Length of bill, Lombok, male, 21.5–23.5 (22.71); Flores, etc., male, 21.5–23.0 (22.0); female, 21.0, 22.0 (21.50). Wing, Lombok, male, 141.0–147.0 (144.85); Rensch (1931), male, 140.0–151.0 (146.50); Flores, etc., male, 141.0–145.0 (142.75); female, 135.0, 137.0, Rensch, 139.0. O.T.F., Lombok, male, 120.0–127.0 (122.28), Rensch, male, 122.0–132.0 (127.15); Flores, etc., male, 116.0–121.0 (119.25); female, Rensch, 128.0. C.T.F., Lombok, male, 109.0–116.5 (113.35); Flores, etc., male, 105.0–112.0 (108.0). Depth of fork (average), male, Lombok, 8.93, Flores, etc., 11.25.

RANGE: Lombok, Flores, Pantar, Alor, and Goenoengapi Islands.

DISCUSSION: The specimen from Goenoengapi, not being fully adult, is not included in the measurements. Its wing, 135, has not reached the measurements of the adults from the other parts of the range of *bimaënsis*. The

tail, however, appears adult, its O.T.F. measuring 121 as compared to an average of 119.25 in the adults from Flores, Pantar, and Alor, and 106.66 in the adults from Sumbawa. One specimen is not enough, but, judging by appearance and measurements, the birds of Goenoengapi appear not to differ from the other populations of *bimaënsis*.

Rensch (1931, p. 589) restricts the type locality of *bimaënsis* to Flores and considers that the birds of this island are similar to those of Sumbawa, but not to those of Lombok. My findings differ from those of Rensch and show instead that the birds of Flores are distinct from those of Sumbawa, but not from those of Lombok. Accordingly I have listed the measurements from both parts of the range separately, and I now give the individual measurements of my specimens together with those of Rensch. Lombok, adult male, wing: 141, 142, 144, 146, 147, 147, (144.85); Rensch, adult male: 140, 147, 148, 151, (146.50); O.T.F.: 120, 121, 121, 122, 122, 123, 127 (122.28); Rensch, 122, 128, 129, 132, (127.15). Flores, adult male, wing: 141, 143; O.T.F.: 116, 120. Pantar, adult male, wing: 145; O.T.F.: 120. Alor, adult male, wing: 142; O.T.F.: 121. Range and average of adult males for Flores, Pantar, and Alor, wing: 141-145 (142.75); O.T.F.: 116-121 (119.25). Rensch had no adult male from Flores, Pantar, and Alor, but only one adult female from Flores whose wing measured 139, and its O.T.F., 128.

My figures are very slightly smaller than those of Rensch for the birds of Lombok, but I have almost twice as many specimens. The figures also show that the birds of Flores, Pantar, and Alor are also very slightly smaller than those of Lombok. However, the differences between the Lombok population and those of Flores, Pantar, and Alor are too slight and the degree of overlap is too great to permit the separation of the two populations, and I think therefore that both should be considered as forming part of the same race, the name of which is *bimaënsis*.

This, however, results in an interrupted range, for in between the two comes Sumbawa, and its population turns out to be definitely smaller than either, and to have the tips of the outer rectrices with a much stronger outward curve. Our three adult

males from Sumbawa measure for the wing: 132.5, 135, 136.5 (134.66); O.T.F.: 105, 107, 108 (106.66). One adult female has 137 and 106, respectively, and an adult female of Rensch, 131 and 110. The difference between the Sumbawa birds and those of the smaller of the two populations of *bimaënsis*, that of Flores, is not great but nevertheless definite, especially in the length of the tail, and in no case are the measurements even close to overlapping. It must be remembered that both Rensch and I are working with small series, and it is entirely possible that the study of much larger series might reverse some of the conclusions reached.

Assuming that they are confirmed, we are forced to consider what the proper name of these two forms should be; that is, Lombok and Flores on the one hand, and Sumbawa on the other.

Part of the original description of *bimaënsis* by Wallace reads as follows: "Hab. Lomboek, (Sumbawa) Temm., and Flores. Remark. The name above quoted [*Edolius bimaënsis*] has no description attached to it in Bonaparte's 'Conspectus' [p. 352]; but I have adopted it for this bird, which is no doubt the same species." Bonaparte's *bimaënsis* is a bare quote of a manuscript name of Temminck and hence a *nomen nudum*, and Wallace, not Bonaparte, became the author of *bimaënsis* when he supplied it with a description.

However, Wallace had no specimens from Sumbawa; all his specimens, as listed in the "Catalogue of the birds in the British Museum" (vol. 3, p. 238) and also as indicated by the above quotation, came from Lombok and Flores. The quotation also shows that he did not examine any Sumbawa specimens but just assumed that the birds of this island would be identical with those of Lombok and Flores. But if Wallace had no specimens from Sumbawa, the description of *bimaënsis*, and hence the type locality, can only have been taken from a Lombok or a Flores specimen—although which, is not stated. Therefore, although the "Catalogue of birds" (*loc. cit.*) shows the majority of Wallace's specimens to have come from Lombok, the restriction of the type locality to Flores by Rensch can be justified.

But as the findings show that the birds of

Lombok are not really separable from those of Flores, the name *bimaënsis* must be applied to both, and *vicinus*, which Rensch gave to the Lombok birds, then becomes synonymous.

As the findings further show that the bird of Sumbawa is distinct from that of Lombok and Flores in size and also in the shape of the tail and since I have shown that *bimaënsis* cannot be used for it, it will require a new name. In recognition of Rensch's fine studies on the Lesser Sundas, I propose that it should be called

***Dicrurus hottentottus renschi*, new subspecies**

TYPE: A.M.N.H. No. 672302; Rothschild Collection; adult male; Tambora Mountain, 3000 feet, Sumbawa; April-May, 1896; W. Doherty, collector.

Similar to *bimaënsis* but smaller, particularly the tail. The fork is very shallow, with the ends of the outer rectrices curling upward as in *bimaënsis* but in addition they are very strongly curved outward (fig. 2, no. 4).

SPECIMENS EXAMINED: Sumbawa: Tambora Mt., "3000 feet," 1 ad. ♂ (the type of *D. h. renschi*), 1 ad. ♂, 1 ad. ♀ (the paratypes of *D. h. renschi*); Bima, 1 ad. ♂, 1 imm. ♀; no locality, 1 imm. ♀, 2 unsexed ad.

MEASUREMENTS OF THE TYPE: Length of bill, from anterior border of the nostril, 22.5, from the skull, 34.5; wing, 132.5; O.T.F., 107.0; C.T.F., 98.0.

MEASUREMENTS: Length of bill, male, 22.0-22.5 (22.16); female, 20.0. Wing, male, 132.5-136.5 (134.66); female, 137.0. O.T.F., male, 105.0-108.0 (106.66); female, 106.0. C.T.F., male, 94.0-98.0 (96.50); female, 96.0. Depth of fork (average), male, 10.16; female, 10.0.

RANGE: Sumbawa Island.

***Dicrurus hottentottus sumatranus* Wardlaw
Ramsay**

Dicrurus sumatranus WARDLAW RAMSAY, 1880, Proc. Zool. Soc. London, p. 15. Ayer-Angat, Paio, and Mt. Sago, Sumatra.

Closely allied to *renschii* and *bimaënsis* but differs from them in the shape of its tail which is virtually square, having almost no fork, and with the ends of its outer rectrices straight or but with a very slight tend-

ency to curve outward (fig. 2, no. 3). The small feathers at the base of the bill similar to those of *renschii* and *bimaënsis*, but more developed and coming farther forward to cover nearly two-thirds of the length of the bill. Mantle pure velvet. General color deep ultramarine blue black with purplish iridescence.

SPECIMENS EXAMINED: Sumatra: northeast, Deli, Bandar Baroe, "900-1400 feet," 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 2 imm. ♀, 1 unsexed imm. Southwest: western Kerintji: Singarong Agong, "2450 feet," 1 ad. ♀; Siolak Dras, "3000 feet," 1 imm. ♂.

MEASUREMENTS: Length of bill, male, 20.0, 22.0 (21.0); female, 19.5, 20.0 (19.75). Wing, male, 151.0, 153.0 (152.0); female, 149.0, 152.0 (150.50). O.T.F., male, 105.0, 108.0 (106.50); female, 105.0, 109.0 (107.0). C.T.F., male, 99.0, 100.0 (99.50); female, 99.0, 102.5 (100.75). "Depth of fork" (average), male, 7.0; female, 6.25.

RANGE: Sumatra.

DISCUSSION: This form has become completely isolated from the other three races of the western branch of wave B, and as a result differs more from the other three than these do from one another. However, except for the shape of the tail, this difference has not taken the form of a departure from the characters of the other three, but has resulted rather in their intensification. The shape of the tail almost always seems to become aberrant, resulting either in the loss of the fork or its exaggeration, wherever the races of *hottentottus* become stranded in the isolation of the extreme periphery of its range.

GROUP C

This group includes all the remaining 13 races of *hottentottus* which have originated from the wave of expansion that I have called wave C. This wave, starting from Obi in the Moluccas, spread westward, giving rise to a group of seven very closely related races made up of the following: *guillemardi* (Obi), *pectoralis* (Sula), *leucops* (Celebes), *jentincki* (Bali and the islands of the Java Sea), *viridinitens* (Mentaweis), *borneensis* (Borneo), and *suluensis* (Sulu Archipelago). *D. h. jentincki* and *viridinitens* were directly derived as a southern extension from Celebes, the main body of the wave continuing onto the

continent from Borneo after having sent an extension into the Palawan group of islands and the western part of the central Philippines. On the continent three races were formed: *hottentottus* for the more southern birds, *chrishna* for those of the Himalayas, and *brevirostris* for those of China. The extension to Palawan gave rise to *palawanensis* for Palawan proper and neighboring islands, *cuyensis* on Cuyo and Semirara, and *menagei* on Tablas.

culmen, these feathers being modified, in most of the races, into a crest made up of hair-like filaments which curve backward over the crown. In addition, the main races of group C differ also from those of groups A and B by the shape of their tail. In these races of group C there is really no true fork; the four inner pairs of rectrices end more or less on the same level, the outer pair being somewhat prolonged and its tips strongly curled upward.

TABLE 9

COMPARATIVE MEASUREMENTS AND CHARACTERS OF ADULT MALES IN THE CENTRAL GROUP OF RACES OF GROUP C OF *D. hottentottus*

Race	General Range	N	Wing	O.T.F.	Iris	Gloss	Incidence of Filaments
<i>guillemardi</i>	Obi Island	6	167.0-172.5 (169.50)	146.0-150.0 (147.60)	Brown	Blue	$\frac{1}{2}$
<i>leucops</i>	Celebes	61	158.0-176.0 (163.00)	135.0-151.0 (143.29)	White	Blue	$\frac{1}{2}$
<i>jentinki</i>	Kangean, Bali, etc.	3	156.0, 156.0, 156.0	126.0-133.0 (130.33)	White	Green	$\frac{1}{2}$
<i>suluensis</i>	Sulu Islands	6	147.0-157.0 (152.34)	120.0-133.0 (129.16)	Red	Blue	All
<i>pectoralis</i>	Sula Islands	7	147.0-153.0 (151.21)	120.0-132.0 (127.40)	Red	Blue	$\frac{1}{2}$
<i>viridiniliens</i>	Mentawai Islands	8	144.0-150.0 (146.25)	112.5-119.0 (115.50)	Red	Green	None
<i>borneensis</i>	Borneo	5	141.0-149.5 (145.25)	110.0-117.0 (114.33)	Red	Blue	All

With the exception of these three more or less aberrant Philippine races, group C is a particularly homogeneous group. The three continental races are but slightly differentiated from one another, the three varying only in a matter of degree from the seven races of the more central group which, in turn, are extremely close to one another.

Group C is also very well differentiated from group A and group B. All of its forms are more ornate, some very much so, their breast spangles being more abundant, much larger and much glossier, the neck hackles longer, as well as much broader and much glossier; group B, as a whole, is intermediate as regards these characters between group A and group C. The forms in group C tend also to be larger, and the shape of their bill is also characteristic. There is but one type of bill in group C, unlike both group A and group B; the bill in group C is longer, less arched, and tapering more towards the tip. Its feathering also is characteristic: it lacks the curved frontal feathers that come forward over the

In the three continental races all of the characters of group C reach their fullest development; the birds are very glossy, the frontal filaments are very long, and the tips of the outer pair of rectrices are completely curled around. On the other hand, in the race (*guillemardi*) of group C, which geographically as well as phylogenetically is closest to the older *atrocaeruleus* of Halmahera, the shape of the bill as well as that of the tail is intermediate: *guillemardi* has frontal filaments but it still retains a few, though much less developed, curved frontal feathers.

The races in the central group are widely distributed but are still so closely related that they are similar in appearance and several have identical measurements. This very great similarity has caused much confusion, and failure to contrast all the forms to one another has invariably led to erroneous conclusions. All are, however, perfectly separable if considered as a group. This can be done as follows:

The two largest are *guillemardi* and *leu-*

cops which are identical in size and can be separated only by the color of the iris which is brown in *guillemardi* and white in *leucops*, and by the filaments of the crest which are longer and more often present in *guillemardi*.

Identical in measurements with one another but a size smaller are the next three, *jentincki*, *suluensis*, and *pectoralis*. Of these,

another size smaller are *viridinitens* and *borneensis*. In *viridinitens*, however, the bill is longer and the gloss is green instead of blue. The complete absence of frontal filaments also differentiates *viridinitens* from *borneensis* as well as from all the other members of the group. The only difference between *borneensis* and *suluensis* is one of size.

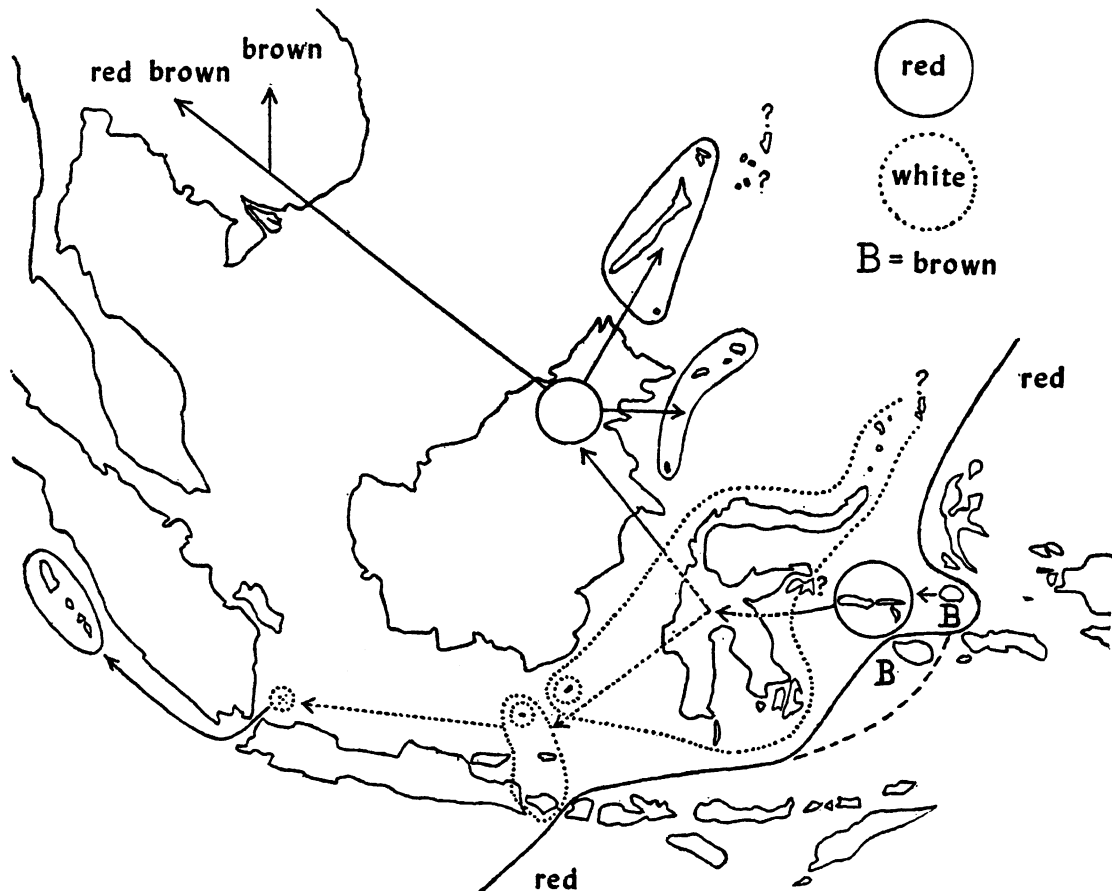


FIG. 11. Variation in the color of the iris in the central races of *Dicrurus hottentottus*; the range of the races of group C is to the left of the solid line marked "red."

jentincki has the white iris of *leucops*, but is considerably smaller, and its gloss is green instead of blue. It differentiates well from *suluensis* and *pectoralis* which both have a red iris and a blue gloss. These two are dangerously close to each other, but *suluensis* can be separated from *pectoralis* by its more deeply forked tail and by the frontal filaments which are present in all adults instead of in half as in *pectoralis*.

Again identical with each other, but still

The table above (table 9) is essential to avoid confusion and much needless repetition. It does not include the Philippine and the continental races because these are more easily separable from the seven central races than they are from one another.

In the races of group C, particularly in the races of the central group, the color of the iris in the adult form is variable: some races, as mentioned above, have the iris white, others have it red, and one form (*guillemardi*) has

it brown, brown or red brown being met again in the continental races. The variation is illustrated by figure 11.

***Dicrurus hottentottus guillemardi* Salvadori**

Dicruropsis guillemardi SALVADORI, 1890, Aggiunte ornitologia della Papuasie e delle Molucche, p. 94 (Mem. Roy. Acad. Torino, vol. 11, p. 220), for *Dicruropsis* sp? Guillemard, 1885, Proc. Zool. Soc. London, p. 571. Bisa Island, Obi Islands. (Type in A.M.N.H.)

Dicrurus dohertyi HARTERT, 1902, Novitates Zool., p. 441. Obi Major. (Type in A.M.N.H.)

Close in measurements with neighboring *atrocaeruleus* but with a somewhat shorter tail, the tips of which curl much more strongly upward. The bill longer, more pointed, a little more compressed laterally, and not so strongly arched as that of *atrocaeruleus*. Differs also in its general appearance, *guillemardi* being much glossier, the breast spangles are of a large oval shape and are much more abundant, very much larger and very much glossier. Neck hackles much better developed, longer, broader, and very well glossed. The frontal feathers less developed and much shorter, not extending forward over the ridge of the culmen. From these frontal feathers spring, in about half of the specimens, a number of hair-like filaments of medium length which curve backward over the crown, reaching to the neck. Mantle very velvety. General coloration strongly blue black, iridescence of the gloss purplish blue. Color of the iris is given as "brown."

SPECIMENS EXAMINED: Obi Islands: Bisa Island, 1 ad. ♀ (the type of *D. guillemardi*). Obi Major, 1 ad. ♂ (the type of *D. dohertyi*), 2 ad. ♂, 4 ad. ♀ (the paratypes of *D. dohertyi*), 3 ad. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 24.5–26.0 (25.40); female, 22.8–25.5 (24.39). Wing, male, 167.0–172.5 (169.50); female, 160.0–168.0 (164.66). O.T.F., male, 146.0–150.0 (147.60); female, 140.0–147.0 (143.50). C.T.F., male, 123.5–131.0 (126.90); female, 122.0–133.0 (127.16). Depth of fork (average), male, 20.70; female, 16.34. Length of filaments, male, 42.0–53.0 (46.0); female, 19.0, 28.0 (23.50), present in six out of 11 adults of both sexes.

RANGE: Obi Islands (Bisa and Great Obi).

DISCUSSION: Hartert named this form

dohertyi, having overlooked, as he later says, the name *guillemardi* by which it had already been called by Salvadori. In comparing this race, Hartert said that it was "nearest to *D. megalornis* of the Key Islands." Examination shows it to be rather so similar to *leucops* from Celebes as to be indistinguishable from it except by the color of the iris. The Kei Islands race is larger than either, has a much longer tail, inconspicuous spangles and hackles, and a characteristic heavy and highly arched beak. It has also no frontal filaments as are found in *guillemardi* and the other members of its group.

***Dicrurus hottentottus pectoralis* Wallace**

Dicrurus pectoralis WALLACE, 1862, Proc. Zool. Soc. London, p. 342. Sula Islands.

Similar to *guillemardi* but smaller. Hackles a little longer, broader, and glossier. Color of the iris red.

SPECIMENS EXAMINED: Sula Islands: Mangoli Island, 7 ad. ♂.

MEASUREMENTS: Length of bill, male, 23.5–25.0 (24.25). Wing, male, 147.0–153.0 (151.51). O.T.F., male, 120.0–132.0 (127.40). C.T.F., male, 114.5–119.0 (116.25). Depth of fork (average), male, 11.15. Length of filaments, male, 8.0–36.0 (21.62), present in four out of seven adults.

RANGE: Sula Islands.

DISCUSSION: In this race the hackles are a little more prominent, and the spangles perhaps tend to be larger, than in the other races of the central group. In these races, however, the size of the breast spangles cannot be used for discrimination for there is, as pointed out by Meyer and Wilesworth (1898), a good deal of individual variation, specimens with larger or smaller spangles being found in all the races.

Dicrurus h. pectoralis is smaller than either *guillemardi* or *leucops*. This size difference is not admitted by Meyer and Wilesworth, but reference to the measurements in table 9 will show that the difference is well marked. There is no overlap at all, even though the measurements of *leucops* are those of 61 specimens. The measurements of *guillemardi* are fewer, but this form averages even larger than *leucops*.

Dicrurus hottentottus leucops Wallace

Dicrurus leucops WALLACE, 1865, Proc. Zool. Soc. London, p. 478. Celebes.

Dicruopsis axillaris SALVADORI, 1878, Atti Acad. Sci. Torino, vol. 13, p. 1184. Great Sangi.

Dicruopsis pectoralis sirensis OBERHOLSER, 1919, Proc. U. S. Natl. Mus., vol. 54, p. 198. Pulo Mata Siri, Laurot Islands, Java Sea. (Type in U.S.N.M.)

Similar to *guillemardi* from which it differs principally in the color of the iris which is white instead of red. Frontal filaments shorter and present in a smaller number of specimens.

SPECIMENS EXAMINED: Islands to the north of Celebes: Talaud Island, Liroeng, 1 ad. ♂. Sangihe Archipelago: Great Sangihe Island, 2 ad. ♀, 1 unsexed imm.; Siao Island, Api, 2 ad. ♂, 1 ad. ♀, 1 imm. ♀; Tahulandang Island, 1 ad. ♀, 1 imm. ♀. Bangka Island, 1 imm. ♂. Lembah Island, 2 ad. ♂, 4 ad. ♀, 1 imm. ♀. Mantehage Island, 1 ad. ♂. Manado Island, 1 ad. ♀.

Celebes: Tip of northern peninsula: Likoe pang, 18 ad. ♂, 2 imm. ♂, 3 ad. ♀, 3 imm. ♀, 1 unsexed imm.; Ajermadidi, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀; Manado Town, 1 ad. ♀, 1 unsexed ad., Mt. Massarang, "3000 feet," 1 ad. ♂; Kumarsot, 2 ad. ♂, 2 ad. ♀; Manembo Nembo, 1 ad. ♂, 1 imm. ♂; Toemaratas, 1 unsexed ad.

Celebes: Northern peninsula: Kwandang, 4 ad. ♂, 1 imm. ♂; Soemalata, 2 ad. ♂; Paleleh, 3 ad. ♂, 2 ad. ♀, 1 unsexed ad.; Kwala Besar, 2 ad. ♂, 2 ad. ♀; Toli Toli, 1 ad. ♀; Tandjoeng Penjoe, 3 ad. ♂, 2 ad. ♀. Foot of northern peninsula: Donggala, 1 ad. ♀; Kasimbar, 1 ad. ♀; Toboli, 1 imm. ♂. Central Celebes: Gimpoe, 8 ad. ♂, 1 imm. ♂, 4 ad. ♀, 2 imm. ♀; Pinedapa, 2 ad. ♂, 1 imm. ♂, 4 ad. ♀. Southern peninsula: Oeroe, 1 ad. ♂, 3 ad. ♀; Enrekang, 1 unsexed imm.; Makassar, 3 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀; Kait Point, near Makassar, 1 ad. ♀; Lompobatang, 1 imm. ♂; Indrulaman, 1 ad. ♂. Southeastern peninsula: Lalolei, 1 imm. ♂; Wawo, 1 ad. ♀.

Islands to the southwest, south, and southeast of Celebes: Laurot Islands, Matasiri Island, 2 ad. ♀ (the type and the paratype of *D. p. sirensis*). Selayer Island, 1 imm. ♂, 1 ad. ♀. Toekang Besi Archipelago: Kalidupa Island, 1 ad. ♂, 1 imm. ♀; Tomia Island, 1 ad. ♂, 1 imm. ♂, 3 ad. ♀; Binongko Island, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀.

Islands to the east of Celebes: Banggai Archipelago: Peling Island, 2 unsexed ad., 1 unsexed imm.; Banggai Island, 2 unsexed ad., 1 unsexed imm.

MEASUREMENTS: Length of bill, male,

23.0–27.0 (24.38); female, 22.5–26.0 (24.34). Wing, male, 158.0–176.0 (163.0); female, 156.0–167.0 (160.44). O.T.F., male, 135.0–151.0 (143.29); female, 128.0–148.0 (140.26). C.T.F., male 115.0–130.0 (121.40); female, 115.0–130.5 (121.72). Depth of fork (average), male, 21.89; female, 18.54. Length of filaments, male, 10.0–36.0 (23.40); female, 8.0–24.0 (15.34), present in 20 out of 100 adults of both sexes.

RANGE: Celebes, mostly in the lowlands, and on the surrounding islands: Talaud, Sangihe Archipelago, Bangka, Talissi (Hickson), Manado, Mantehage, Lembeh, Togian (Meyer), Matasiri, Selayer, Moena and Boetoeng (Elbert), the Toekang Besi Archipelago, and Peling and Banggai Islands.

DISCUSSION: Our extensive material confirms Meyer and Wigglesworth (1898, p. 439) in that this form is "highly variable as regards size," but that it otherwise shows no geographic variation, as was also noted by Stresemann (1940).

The population from Great Sangihe Island was named *axillaris* by Salvadori on the basis of having the axillaries and under wing coverts broadly tipped with white. This is a mark of immaturity which sometimes persists to a varying degree in adults, not only in *leucops* but in all races of *hottentottus* as well as in most other drongos. Meyer and Wigglesworth (1898, p. 438) state that in one out of three of their specimens from Great Sangihe, the white spots were actually smaller than in adults from Celebes, and my material bears this out. As the Sangihe populations do not differ in size or in any other character from those of Celebes proper, I consider *axillaris* to be a synonym of *leucops*.

Oberholser in 1919 named two adult females from Matasiri Island as *sirensis*, stating that this form was separable from *leucops* "by its rather duller upper surface, longer hackles on the sides of the neck, and duller, more brownish posterior lower parts." Comparison of these two specimens with our large series of *leucops* shows them to be absolutely identical, and since they match perfectly the proportions and measurements of other adult females from Celebes, *sirensis* must also be considered a synonym of *leucops*.

I have united the Peling and Banggai

birds with *leucops* rather than with *pectoralis*, as was done by Meyer and Wigglesworth (1898, p. 440), who admit that in so doing they are acting "from mere guess-work" as to the color of the iris. My reason for uniting the Peling and Banggai birds with *leucops* is that in size they fall within its range of variation, but not within that of *pectoralis*. Four adults have the wing, 162, 163, 168, 168.5 (165.37); O.T.F., 147, 148, 152 (149.00); fork, 22, 25.5, 28.5 (25.33). In *leucops*, adult males, wing, 158.0–176.0 (163.00); O.T.F., 135.0–151.0 (143.29); average depth of fork, 21.89. In *pectoralis*, adult males, wing, 147.0–153.0 (151.21); O.T.F., 120.0–132.0 (127.40); average depth of fork, 11.15.

In turn, my guess is that when specimens are collected and the color of the iris is noted, it will be found to be white instead of red; if it is red as in *pectoralis*, a new race may have to be named, as the birds of Peling and Banggai are larger than those of the Sulas.

The range of *leucops* apparently extends as far north and east as the Talaud Islands. I have a specimen from these islands, collected in March, 1897, at Liroeng by J. Whitehead. It is an adult male in good plumage, but unfortunately the color of the iris was not noted. Its measurements: bill, 23.5; wing, 158; C.T.F., 114; O.T.F., 137, fit in with those of *leucops* though on the small side. The measurements of the bill and wing do not fit in with those of *morotensis* in which the length of the bill is 19.75 and that of the wing 148.50. In the Talaud specimen also, the other characters, such as the appearance of the plumage and the shape and feathering of the bill, are similar to those of *leucops*, but not to those of *morotensis* or the other members of group A.

Dicrurus hottentottus jentinki Vorderman

Chibia jentinki VORDERMAN, 1893, Natuur. Tijdschr. Nederlandsch Indië, vol. 52, p. 194. Ardajasa, Kangean Islands.

Chibia ter Meuleni FINSCH, 1907, Jour. für Ornith., vol. 55, p. 302. Pulu Pajung, Thousand Islands [western Java].

Dicruopsis pectoralis solombensis OBERHOLSER, 1919, Proc. U. S. Natl. Mus., vol. 54, p. 184. Solombo Besar Island, Java Sea. (Type in U.S.N.M.)

Similar to *leucops*, including the color of

the iris, which is white in both, but smaller, much less blue, duller and more black, and with the gloss strongly greenish rather than purplish blue.

SPECIMENS EXAMINED: Kangean Island, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀. Bali, 1 ad. ♂, 1 imm. ♀. Solombo Besar Island, 1 ad. ♀ (the type of *D. p. solombensis*), 2 imm. ♂, 1 ad. ♀, 1 imm. ♀ (?) (the paratypes of *D. p. solombensis*).

MEASUREMENTS: Length of bill, male, 24.5–26.0 (25.16); female, 23.5–24.5 (24.12). Wing, male, 156.0, 156.0, 156.0; female, 150.0–159.0 (154.25). O.T.F., male, 126.0–133.0 (130.33); female, 125.0–134.0 (128.50). C.T.F., male, 111.0–126.5 (118.83); female, 115.0–124.5 (118.87). Depth of fork (average) male, 11.50; female, 9.63. Length of filaments, male, 19.0 and 35.0 (22.0); female, 13.0–35.0 (25.33), present in five out of seven adults of both sexes.

RANGE: Solombo Besar Island, Kangean Islands, Noesa Penida Island (Meise), Bali, eastern end of Java (Kloss), and the Thousand Islands off the western end of Java (Finsch).

DISCUSSION: Vorderman in the original description compared *jentinki* as being closest to *bimaensis* from Sumbawa. Rather, the two are not closely related, and widely differ in all characters.

Dicrurus h. jentinki, instead, very obviously reached the Sunda chain from Celebes by way of Solombo Besar and Kangean. After becoming established on Bali it crossed over to the eastern end of Java, but curiously enough failed to spread in the rest of the island, only to turn up again at the other extremity of Java in the Thousand Islands. This interesting distribution is very well illustrated by Stresemann's map (1939, p. 334).

The population from Solombo Besar was named *solombensis* by Oberholser, but I find, after examining Oberholser's specimens, that they are identical in all characters, such as color of the iris, greenish gloss, proportions and measurements, spangles, etc., with topotypical *jentinki* from Kangean.

The population from the eastern end of Java was collected by Kloss (1921c) at Badjoelmati, 30 miles due north of Banjoewangi, from January 31 to February 7. The measurements given, as well as the other characters, such as the yellowish white iris of the adult,

are typical of *jentincki*. There is of course the possibility that these birds were not bred on Java, but had wandered from near-by Bali.

The population from the Thousand Islands was described as *ter Meuleni* by Finsch who compares it to *leucops*, but nowhere does he make any reference to *jentincki*, a form the existence of which was apparently unknown to him. In his original description no characters are mentioned which would indicate any difference between the population of the Thousand Islands and that of topotypical *jentincki* in the Kangean Islands. Unfortunately, no specimens from the type locality of *ter Meuleni* are available to me for examination, but I am forced to consider it a synonym of *jentincki*, until an actual comparison can be made between specimens from the Thousand Islands with others from Kangean.

Dicrurus hottentottus viridinitens Salvadori

Dicruropsis viridinitens SALVADORI, 1894, Ann. Mus. Civ. Genoa, ser. 2, vol. 14, p. 593. Pisac-sac, Si Oban [Sipora], Mentawai. ("Typus b" of the author's list in A.M.N.H.)

Similar to *jentincki* but smaller and with the color of the iris red instead of white. Color of the gloss strongly greenish as in *jentincki*. Differs from *jentincki* and the other members of its group in having no frontal filaments.

SPECIMENS EXAMINED: Mentawai Islands: Siberut Island, 2 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 imm. ♀, 1 unsexed imm. Sipora Island: Si Oban, Pisac-sac, 1 ad. ♂ (cotype "b" of *D. viridinitens*); 2 ad. ♂, 1 ad. ♀, 1 imm. ♀, 1 unsexed ad. North Pagi Island, 1 ad. ♂, 2 ad. ♀. South Pagi Island, 2 ad. ♂, 2 ad. ♀, 1 imm. ♀, 1 unsexed imm.

MEASUREMENTS: Length of bill, male, 23.0–24.5 (23.18); female, 22.0–23.5 (22.50). Wing, male, 144.0–150.0 (146.25); female, 140.0–148.0 (142.75). O.T.F., male, 112.5–119.0 (115.50); female, 109.0–116.0 (113.83). C.T.F., male, 102.5–113.0 (106.50); female, 104.0–107.0 (105.33). Depth of fork (average), male, 9.0; female, 8.5.

RANGE: Mentawai Islands (Siberut, Sipora, North and South Pagi).

DISCUSSION: There are no significant differences between the various populations; the gloss of the Sipora birds is perhaps slightly greener, and in the South Pagi birds the bill

is a little longer, being intermediate between that of *jentincki* and that of the birds from farther north in the Mentaweis.

Salvadori in the original description compared *viridinitens* as being similar to *sumatranus*, a not unnatural premise since the two are close neighbors and the logical assumption would have been that *viridinitens* had reached the Mentaweis from Sumatra. However, examination shows the two to be not closely related.

The tail in *viridinitens* has a shallow fork, as in *sumatranus*, but in its shape, as well as in every other character such as the shape and feathering of the bill and the basic pattern of the plumage, *viridinitens* is a typical member of the central group of races of group C. *D. h. sumatranus*, on the other hand, forms part of the western branch of group B, being most closely related not to *viridinitens*, but to *bimaënsis* and *renschii* of the Lesser Sundas from which it appears to have been derived.

Dicrurus h. viridinitens has very evidently been derived from *jentincki*; their plumage pattern is exactly similar, the main difference being a small one of size. It is also true that they differ in the color of the iris and in the presence of frontal filaments which are lacking in *viridinitens*. But we have seen that the color of the iris and the incidence of frontal filaments in the *guillemardi* group varies from race to race. They may be lacking in as many as four-fifths of the specimens as in *leucops*. Their total loss in *viridinitens* may have been caused as a result of becoming isolated from the other members of its group.

Dicrurus hottentottus borneensis Sharpe

Chibia borneensis SHARPE, 1879, Proc. Zool. Soc. London, p. 246. Kina-Balu, Borneo.

Similar to *viridinitens* in size except for the bill which is a little smaller. Differs from it in tending to have larger spangles, and by its general color being bluer and its gloss strongly purplish blue rather than strongly greenish. Differs from all the other races of this group so far considered in having frontal filaments always present in all the adults.

SPECIMENS EXAMINED: Northern Borneo: northern Borneo: Mt. Kina Balu, "1000–5000 feet," 4 ad. ♂, 1 imm. ♂, 3 ad. ♀, 2 imm. ♀, 1 unsexed ad.; Kinabatangan River, 1 imm. ♀. Northern

Sarawak, Baram River, Dulit, "4000-5000 feet," 1 ad. ♂, 1 imm. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, male, 20.5-22.5 (21.66); female, 21.0-23.0 (21.62). Wing, male, 141.0-149.5 (145.25); female, 139.0-147.0 (142.50). O.T.F., male, 110.0-117.0 (114.33); female, 108.0-112.0 (111.66). C.T.F., male, 100.0-111.0 (104.0); female, 99.0-107.0 (102.66). Depth of fork (average), male, 10.33; female, 9.0. Length of filaments, male, 37.0-58.0 (43.66); female, 23.0-40.0 (30.50), present in all adults of both sexes.

RANGE: Northern Borneo.

Dicrurus hottentottus suluensis Hartert

Dicrurus suluensis HARTERT, 1902, Novitates Zool., vol. 9, p. 441. Maimbun, Sulu [=Jolo] Island. (Type in A.M.N.H.)

Larger than neighboring *borneensis* but otherwise similar to it as well as to the other members of its group. Similar in size and color to *pectoralis* but differs from it in having a more deeply forked tail, and by the frontal filaments, which, as in *borneensis*, are present in all the adults, instead of in half as in *pectoralis*.

SPECIMENS EXAMINED: Sibutu Island, 1 ad. ♀, 1 imm. ♀. Sulu Archipelago: Tawitawi Island, Tataan, 1 ad. ♂, 1 ad. ♀; Lapac Island, 1 ad. ♂; Sulu [=Jolo] Island, Maimbun, 1 ad. ♂ (the type of *D. suluensis*), 1 ad. ♂, 1 imm. ♂, 1 unsexed ad., 1 unsexed imm. (the paratypes of *D. suluensis*); Sulu Island, no locality, 2 ad. ♂, 3 ad. ♀, 1 unsexed ad.

MEASUREMENTS: Length of bill, male, 23.0-26.0 (24.51); female, 22.0-24.0 (22.80). Wing, male, 147.0-157.0 (152.34); female, 148.0-157.0 (151.00). O.T.F., male, 120.0-133.0 (129.16); female, 124.0-135.0 (128.00). C.T.F., male, 112.0-119.0 (113.67); female, 110.0-119.0 (113.40). Depth of fork (average), male, 15.49; female, 14.60. Length of filaments, male, 26.0-39.0 (30.00); female, 12.0-30.0 (18.50), present in all adults of both sexes.

RANGE: Sibutu, the Sulu Archipelago, and Maratua (Bangs and Peters).

DISCUSSION: Bangs and Peters (1927) give the wing length of three adult males collected on Maratua Island, off the coast of northeastern Borneo, as 149, 151, 157 (152.33), and their tail length as 126, 136, 137

(133.0). The bill length is also given but was not taken in a comparable way. The authors correctly remark that these measurements show that the birds of Maratua are quite different from *D. h. borneensis* and appear "very close to, if not identical with" *D. h. suluensis*.

In my series, five adult males from Borneo measure, wing: 141.0-149.5 (145.25); O.T.F.: 110.0-117.0 (114.33). Six adult males from the Sulu Archipelago measure, wing: 147.0-157.0 (152.34); O.T.F.: 120.0-133.0 (129.16). There is a slight difference in the length of the O.T.F. between the birds of the Sulus and those of Maratua, but this difference is probably due to the small size of the sample or to personal equation. The wing length is exactly the same, and I agree with Bangs and Peters that the birds are probably identical.

The two populations of *D. h. suluensis* are not derived from each other but apparently, as the birds expanded from Borneo to become established on the outlying islands, they underwent an increase in size similar in extent in both the Sulus and Maratua.

Dicrurus hottentottus hottentottus Linnaeus

Corvus hottentottus LINNAEUS, 1766, Systema naturae, ed. 12, vol. 1, p. 155. Cape of Good Hope. Based on "le Choucas du Cap de Bonne Espérance," Brisson, 1760, Ornithologia, vol. 2, p. 33, pl. 2, fig. 2. Type locality corrected and restricted "to the region between Ayuthia and the head of the Gulf" of Siam by Kloss, 1921, Jour. Federated Malay States Mus., vol. 10, p. 223.

Edolius barbatus J. E. GRAY, 1831, Zool. Misc., p. 34. Calcutta. Based on the Krishna Crow of Latham, 1822, A general history of birds, vol. 3, p. 51, pl. 11.

Criniger splendens TICKELL, 1833, Jour. Asiatic Soc. Bengal, vol. 2, p. 574. Borabhum and Dholbhum, Chota Nagpur.

Chibia hottentota [sic] *londae* KOELZ, 1939, Proc. Biol. Soc. Washington, vol. 52, p. 70. Londa, southern Bombay Presidency. (Type in A.M.N.H.)

All the characters of *hottentottus* are similar to those of *guillemardi* and the other races of the central group, but they are more developed and represent the peak of the evolutionary line which started from Obi in the Moluccas. In *hottentottus* the breast spangles and hackles are more prominent and more brightly glossed, the spangles tend to be more

numerous and the hackles are broader and considerably longer. The frontal filaments (fig. 12) are more numerous and are twice as long. The bill is a little longer than in *guillemardi*, more pointed, and slightly more compressed at the tip, but in general size (length of the wing and tail), *guillemardi* and *hottentottus* are identical.

The most characteristic difference is the shape of the tail; in *hottentottus* (fig. 2, no. 8),

Mysore, Tumkur district, Namadachitume, 1 subad. ♂, 1 ad. ♀. Bengal, Calcutta, 1 imm. ♀. Northern Cachar Hills: Gunjong, 2 ad. ♂, 3 ad. ♀; Maher, 1 ad. ♂; "northern Cachar," no locality, 1 ad. ♀.

B. Burma: Upper Chindwin, Pya, 1 ad. ♂. Upper Burma, Bhamo, 1 unsexed ad. Lower Burma: Thayetmyo, 1 unsexed ad.; Thandaung, 1 ad. ♀; lower Pegu, 1 ad. ♂. Tenasserim: Lampha, 1 ad. ♂; Um Pang, western Siam, near Burmese border, east of Lampha, 1 ad. ♂; Taok

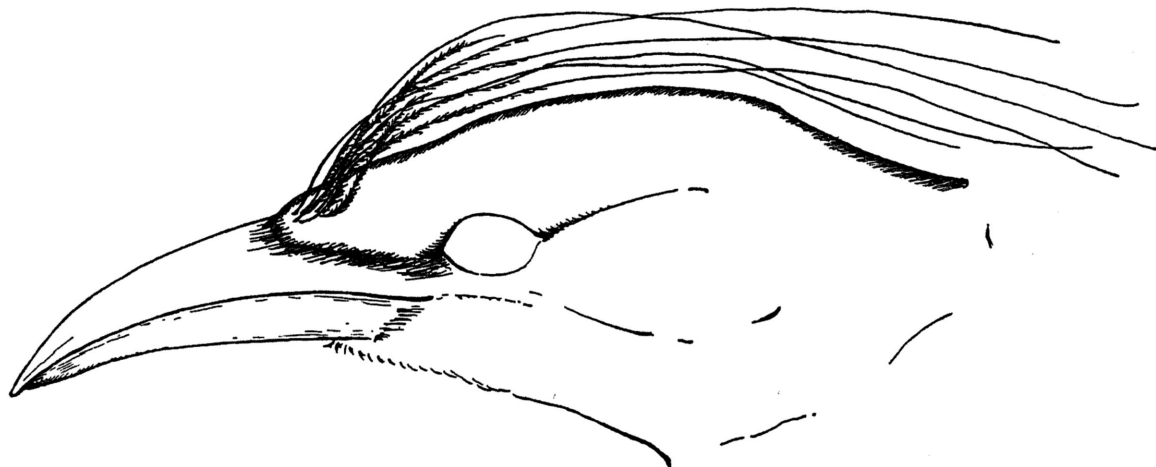


FIG. 12. Head of *Dicrurus h. hottentottus*.

as well as in the other two continental races (*chrishna* and *brevirostris*), the four inner pairs of rectrices end on a level and there is as a result no true fork; the outer pair is a little longer and at about its distal third or fourth the shaft begins to spiral outward and upward, twisting and curling the tip of these feathers completely around. The same tendency, more or less pronounced, exists also in the races of the central group, but the tips of the outer rectrices, although generally very strongly curling upward, are never completely curled around and the four inner pairs, as a rule, do not quite end on the same level.

The general color of *hottentottus* is a strong blue black and that of its gloss a rich purplish blue. Color of the iris "brownish red" or "dark red brown."

SPECIMENS EXAMINED: A. India: southern Bombay Presidency: Londa, 1 ad. ♂ (the type of *C. h. londae*), 1 ad. ♂, 7 ad. ♀, 2 subad. ♀ (the paratypes of *C. h. londae*); Jagalbed, 1 ad. ♂.

Plateau, 2 ad. ♂; Thaungyin, 1 ad. ♂; Yoon-galun River, 1 ad. ♂, 1 imm. ♀.

C. Siam, southern Annam (collected during the breeding season): Northern Siam: Doi Khrang (August 1), 1 ad. ♀; Doi Pu Che (May 30), 1 ad. ♂; Ban Nam Kien (April 18-22), 3 ad. ♂, 3 ad. ♀; Ban Huai (June 12), 1 imm. ♂. Eastern Siam: Pak Chong (April 29-May 6), 3 ad. ♂, (June 21-July 5), 1 ad. ♀, 1 imm. ♀; Lam Klong Lang (June 14), 1 ad. ♀; Muak Lek (April 25), 1 ad. ♂, 1 ad. ♀; Knong Phra (April 13-15), 1 ad. ♂, 1 ad. ♀; Chantuk (June 7), 1 ad. ♂; Lat Bua Kao (August 10), 1 imm. ♂. Southern Annam: southeast end of Langbian Plateau (July), 1 ad. ♀; "near Dalat" (June), 1 unsexed imm.

D. Siam, southern Indochina (outside of the breeding season): Siam: Lomkao (February 21), 2 ad. ♂; Sakon Nakhon (March 10), 1 ad. ♂; Sikeu, near Khorat (February 3-17), 2 ad. ♂; Pak Chong (February 22), 1 ad. ♂, (September 5), 1 imm. ♂, 1 imm. ♀; Tha Chang, near Pak Chong (March 20-22), 2 ad. ♂; Bangkok (December 31), 1 ad. ♀; Koh Chang (September 1), 1 ad. ♂. Southern Indochina: Fimnon Forest (November), 2 ad. ♂, 1 ad. ♀; Bolovens Plateau

(January 30), 1 ad. ♀; Djiring (March 15), 1 ad. ♂; Daban (March 17-25), 2 ad. ♂.

REMARKS ON THE MEASUREMENTS: The measurements given for adult *D. h. hottentottus* and used throughout the discussion include only those of the specimens from India and Burma (paragraphs A and B), and those collected during the breeding season (paragraph C) in Siam and southern Indochina. The specimens from these two regions collected outside of the breeding season (paragraph D) are also *D. h. hottentottus*, but as the difference between this race and *brevirostris* is only a rather small one in measurements, and these two regions are overrun by migrant *brevirostris*, it is better to exclude them.

MEASUREMENTS: Length of bill, male, 25.5-29.5 (27.62); female, 24.5-29.0 (26.96). Wing, male, 160.0-172.0 (165.80); female, 154.0-166.0 (160.38). O.T.F., male, 132.0-155.0 (142.42); female, 131.0-149.0 (139.50). C.T.F., male, 117.0-135.0 (126.15); female,

of the continental birds, consisting of 166 specimens, was examined by Baker (1919), his conclusions, as shown by his measurements, being that the birds from the Himalayas are larger than those of Bombay, central India, Burma, and Siam, and that the Chinese birds differ from all the others by their shorter bill.

Baker was followed by Kloss (1921c, p. 222) who examined fresh series from the collections of the Federated Malay States museums side by side with those in the Indian Museum. His conclusions are similar to Baker's, but they are stated more explicitly, namely "that in the North of India from the Northwest to the Eastern Himalayas and Assam—and perhaps North Burma and the Shan States—the birds are, on the whole, larger; whereas in Bombay, Central India, Bengal, South Burma and Siam to Cochin-China and Annam they average not so large."

TABLE 10
COMPARATIVE MEASUREMENTS OF THE CONTINENTAL RACES OF *D. hottentottus*

Race	N	Bill	Wing	O.T.F.	C.T.F.	Fork
<i>chrishna</i>	20*	29.70	172.70	155.54	130.10	25.44
<i>hottentottus</i>	26 ♂	27.62	165.80	142.42	126.15	16.27
	22 ♀	26.96	160.38	139.50	124.35	15.15
<i>brevirostris</i>	18 ♂	25.50	171.74	142.00	132.58	9.42
	25 ♀	25.00	168.00	138.00	129.22	8.78

* The 20 adult specimens of *chrishna* consist of nine males, three females, and eight unsexed.

120.0-132.5 (124.35). Depth of fork (average), male, 16.27; female, 15.15. Length of crest, male, 61.0-114.0 (83.0); female, 62.0-82.0 (72.0).

RANGE: Peninsular India, mainly on the western coast in Bombay Presidency, Mysore, Coorg (Betts), Central Provinces and Chota Nagpur (Baker), Eastern Ghats (Jerdon), southern Bengal, probably the Khasi Hills (where it may intergrade with *chrishna*), northern Cachar, Burma and northern Tenasserim, Siam, and southern Indochina. Intergrades with *chrishna* in northern Burma, and with *brevirostris* in northern Burma, southwestern Yunnan, and probably in central Indochina.

DISCUSSION: The British Museum series

Baker recognized provisionally but two races, *brevirostris* for the Chinese birds and *hottentottus* for all the others. Kloss, on the other hand, is of the opinion that three races should be recognized, and, as he puts it, "It seems that there are (I) in the north a larger bird with (a) a large bill in the Himalayas (*chrishna* Gould) and (b) a small bill in China (*brevirostris* Cabanis): (II) in the south a rather smaller bird with a bill of intermediate size (*hottentottus* Linn.)." And he adds, "Whether the bird of Bombay and Central India is distinct requires, as Mr. Baker says, a larger series than is available to show. I fancy it is not: the few measurements given are well within the range of a series from Burma and Siam."

I, in turn, have examined still other series consisting of 206 specimens from the collections of the American Museum of Natural History and the United States National Museum, and this material confirms exactly the findings of Kloss.

The averages of my measurements, for only strictly adult birds, of the three races are given in table 10.

The length of the crest is variable, but the extremes and the averages are the same in all three races: 60.0–106.0 (85.20) in *chrishna*, 62.0–106.0 (83.25) in *brevirostris*, 61.0–114.0 (83.0) in *hottentottus*.

The more northern birds, *chrishna* and *brevirostris*, tend to be a little brighter and bluer than *hottentottus*.

The Chinese bird is migratory, and Deignan (1945) reports it as arriving in October in northern Siam. My specimens show that these migrants can be found throughout Siam, Tenasserim (Bok Pyin), and southern Indochina. As these migrants are larger than the resident race, the measurements from these regions should include only those of specimens collected during the breeding season or during the summer months.

As noted by Kloss (1921c) certain specimens can be found showing a combination of characters such as a short wing and long bill, or vice versa. Kloss' specimens as well as similar specimens of my own would seem to be intergrades, as they all come from the common borders of the range, mostly in upper Burma and extreme northwestern Yunnan.

I have not enough material from northern Burma and none from the Shan States to decide whether these birds are best referred to *chrishna* or *hottentottus*. So far, the few specimens that I have examined from northern Cachar and northern Burma do not differ from *hottentottus* of farther south. Until additional material can be studied, I am inclined to believe that if the birds of northern Burma are found to differ from *hottentottus*, they are likely to prove to be intermediate in size between this latter and *chrishna*.

The following measurements, and the conclusion, are pertinent to the question raised by both Baker and Kloss as to whether or not the birds of Bombay and central India are distinct from those of Burma and Siam.

All the measurements are of adult specimens only.

Bombay Presidency: Males, wing: 165, 166, 166, 167 (166.0); bill: 27, 28, 28 (27.66). Females, wing: 156, 156, 160, 161, 161.5, 162, 164.5 (160.14); bill: 26, 26.5, 27, 28, 28, 28, 29 (27.50).

Mysore: Female, wing: 162.0, bill: 26.5.

Lower Burma: Males, wing: 160, 160.5, 161, 164, 166, 166, 166 (163.36); bill: 26.5, 27, 27, 27.5, 27.5, 28 (27.25). Female, wing: 166, bill: 27.0.

Northern Siam (breeding, April 18–May 30): Males, wing: 160, 166, 167, 168 (165.25); bill: 27.5, 28, 29, 29 (28.37). Females, wing: 154, 155, 159 (156.0); bill: 26, 26.5, 28, 29 (27.37).

Central eastern Siam, region of Khorat (breeding, April 13–June 7): Males, wing: 162, 165, 166, 166, 170, 171 (166.67); bill: 25.5, 26.5, 26.5, 27.5, 28, 28.7 (27.12). Females, wing: 157, 160, 164, 165 (161.50); bill: 24.8, 25.5, 26, 27.5 (26.0).

The measurements of the O.T.F. and C.T.F. are omitted as they show exactly the same similarity.

The range of variation and the averages of these specimens certainly show that the birds of Bombay and Mysore are not separable from those of Burma and Siam.

This leaves the consideration of the type locality of *hottentottus*; I regret that space must be taken to discuss it, but much confusion still exists. It was caused by Baker's (1919) unfortunate selection of Sikkim as the type locality, and his subsequent action in ignoring the correction proposed by Kloss.

As Kloss (1921c) says, the selection of a type locality should have at least "the appearance of probability," and Sikkim is very improbable for a bird known to Brisson. Kloss accordingly disregarded Sikkim and chose the same locality that he had already designated for the bird that Brisson had definitely stated to have come from Siam, and upon which Linnaeus based his *Cuculus* [= *Dicrurus*] *paradiseus*. It is at least logical to presume that, since both birds are found in Siam, if one of Brisson's birds came from there, the other very likely might have come from there too.

There is also another reason against retaining Sikkim, because this region was already

preoccupied as a type locality. As Baker's own figures and those of my specimens show, all the Himalayan birds are alike, and the birds of Nepal had already been described by Gould as *chrishna* in 1836.

Baker (1930, p. 164) must have known of Kloss' action and, although he ignored it, he became aware that Sikkim was not tenable, for he substituted Travancore for Sikkim without a word of explanation why Siam could be disregarded if Sikkim was not maintained. But, as Whistler remarks (1933, p. 352), "Travancore is if possible more unfortunate still" as, so far, there is no evidence that the bird even occurs in Travancore.

Whistler unfortunately still perpetuates the confusion, because, after seemingly admitting that Kloss is correct, and in spite of saying that the choice of Sikkim is bad, he still goes back to it as the type locality on the excuse that "As I have no fresh specimens for examination I leave the problem to others."

There is no problem if the logic, which is all in favor of Kloss, is accepted. I have the fresh specimens, and their examination shows that the birds of Bombay and Mysore are similar to those of Siam, and must therefore also be called *hottentottus*. The renaming of the birds of Bombay as *londae* by Koelz is then unnecessary and was no doubt due to the confusion caused by Baker's unwise choice of a type locality.

***Dicrurus hottentottus chrishna* Gould**

Edolius chrishna GOULD, April, 1836, Proc. Zool. Soc. London, p. 5. Nepal.

Edolius casia HODGSON, November, 1836, Indian Rev., vol. 1, p. 324. Nepal.

Similar to *hottentottus* but larger in every measurement.

SPECIMENS EXAMINED: Northern Punjab, Kangra, Bhadwar, 1 ad. ♂. Kumaon: no locality, 1 unsexed ad.; Naini Tal, 1 ad. ♂, 1 imm. ♀. "Nepal Tuai" (not located), 1 ad. ♀. Nepal: Amlekhganj, 1 subad. ♂, 1 ad. ♀; Simra, 2 ad. ♂; Hetora, 1 subad. ♀, 2 imm. ♀, 1 nestling ♂. Northern United Provinces, Nichlaul, 1 ad. ♂. Sikkim: Wamtchi, 1 unsexed ad.; Rough Bridge, 1 unsexed ad.; "Sikkim," no locality, 4 unsexed ad. Northern Bengal: Darjeeling, 1 unsexed ad.; Sukna, 1 ad. ♂; Siliguri, 1 imm. ♂, 1 imm. ♀. Western Assam, Tura, 1 ad. ♂, 1 ad. ♀. Assam, Ampoti, "not located," 1 ad. ♂. Northwestern

Yunnan: Changhung, upper Salween River, 1 ad. ♂; "upper Salween River," 1 imm. ♀.

Measurements: Length of bill, male, 28.0–30.5 (29.70); female, 28.0–30.0 (29.0); all adults, 28.0–32.0 (29.70). Wing, male, 168.0–180.0 (173.60); female, 165.0–183.0 (172.0); all adults, 164.0–183.0 (172.70). O.T.F., male, 149.0–164.0 (157.0); female, 144.0, 163.0 (153.50); all adults, 144.0–164.0 (155.54). C.T.F., male, 126.0–134.0 (129.20); female, 131.0–143.0 (133.0); all adults, 126.0–143.0 (130.10). Depth of fork (average), male, 27.80; female, 20.0; all adults, 25.44. Length of crests, male, 62.0–91.0 (78.40); female, 88.0, 99.0 (93.50); all adults, 62.0–106.0 (85.20).

RANGE: Along the Himalayas from northwestern Punjab (Murree) (Baker), Garo Hills, to eastern Assam and northwestern Yunnan. Intergrades with *hottentottus* in northern Burma and with *brevirostris* in northern Burma and northwestern Yunnan.

***Dicrurus hottentottus brevirostris* Cabanis and Heine**

Trichometopus brevirostris CABANIS AND HEINE, 1850, Museum Heineanum, pt. 1, p. 112. China.

Similar to *hottentottus* and *chrishna* but with the bill shorter than in either. Wing length same as in *chrishna*, tail shorter, equal to that of *hottentottus* but a little less "forked." More adults of *brevirostris* than of either of the other two races show a tendency to have the proximal half or third of the frontal filaments partially and finely barbed rather than mostly naked. Color of the iris "dark brown."

SPECIMENS EXAMINED: A. (Migrants): Tenasserim, Siam, southern Indochina. Tenasserim: Bok Pyin (February 13–17), 1 ad. ♂, 5 ad. ♀, 3 imm. ♀. Southern Annam: Fimnon Forest (November), 1 ad. ♂, 3 ad. ♀, 1 unsexed ad. Southern Siam: Koh Chang (January 13), 1 ad. ♂; Kao Sabab, near Chanthaburi (November 20), 1 ad. ♂; Kanchanaburi (September 10–19), 1 ad. ♂, 1 ad. ♀; Wang Kien, near Kanchanaburi (March 13), 1 ad. ♀; Bangkok (December 21), 1 ad. ♀; Lat Bua Kao (October 15), 1 ad. ♂, 1 imm. ♀; Pak Chong (December 8–February 5), 3 ad. ♀; Sikeu, near Khorat (February 3), 1 ad. ♀. Northern Siam: Doi Nangka (November 10), 1 ad. ♂; Doi Suthep (January 11), 1 ad. ♀.

B. (Breeding or collected in the breeding

range): Northern Laos: upper Nam Hou River (June 19–21), 1 ad. ♂, 1 ad. ♀. Tonkin: near Laichau (May 5–13), 3 ad. ♂, 2 ad. ♀; Chapa (October 30–November 18), 1 imm. ♂, 1 imm. ♀. Southern Yunnan: Mengtsz (July 3), 1 imm. ♂. Northwestern Yunnan: Tengyueh, "6–7000 feet," (September–October), 4 imm. ♂, 1 imm. ♀. Szechwan: Changlinshian (May 6–8), 2 ad. ♀; Tseo Jin Geo, south of Changlinshian (March 25), 1 ad. ♀; Mt. Omei (August 11–September 1), 6 ad. ♂, 1 subad. ♂, 4 ad. ♀, 1 unsexed ad.; Jungshien (August 4), 1 imm. ♀; Tsao Po (October 3), 1 ad. ♀; Shin Kai Si (August 26), 1 imm. ♀; Kwanhsien (September 21), 1 ad. ♂. Sikang: Tatsienlu (May 29), 1 ad. ♀. "Mts. western China," no locality or date, 2 unsexed ad., 1 unsexed imm. Kwantung: Kowloon (August 19), 1 imm. ♂; Tai Yang, near Swatow (April 20), 1 ad. ♀. Fukien: Amoy (April 20), 1 unsexed ad.; Futsing (August 2), 1 imm. ♂; Foochow (May 26), 1 imm. ♀; "Fukien," no locality (May 24), 1 ad. ♂. Chekiang: Nimrod Sound (September 20), 1 ad. ♂; Ningpo (September 13), 1 ad. ♂. "Lushan foot hills, East China" (not located) (June 17), 1 ad. ♀. Kiangsu: Chinkiang (May 11–September 28), 8 ad. ♂, 14 ad. ♀, 1 unsexed imm. Hupeh: Hsing Chan (June 8), 1 ad. ♀. Hopeh: Chihli, Tientsin (May 23), 1 ad. ♂.

The measurements given throughout for adult *brevirostris* are only those of the specimens in paragraph B.

MEASUREMENTS: Length of bill, male, 24.0–27.0 (25.50); female, 23.0–27.0 (25.0). Wing, male, 164.0–182.0 (171.74); female, 159.0–175.5 (168.0). O.T.F., male, 136.0–152.0 (142.0); female, 132.0–146.0 (138.0). C.T.F., male, 122.0–145.0 (132.58); female, 121.0–136.0 (129.22). Depth of fork (average), male, 9.42; female, 8.78. Length of crest, male, 62.0–106.0 (83.25); female, 65.0–97.5 (82.69).

RANGE: The greater part of China from northern Hopeh (Tientsin) to Tonkin and northern Laos. Intergrades with *chrishna* in northern Burma and northwestern Yunnan, with *hottentottus* in northern Burma and southwestern Yunnan and probably central Indochina. In the fall the more northern birds migrate south, migrants being found through the whole of Indochina, Siam, lower Burma (probably), and to southern Tenasserim (Bok Pyin).

DISCUSSION: The shortness of the bill in *brevirostris* is characteristic. Two good breeding series from typical parts of the range show

that the average length of the bill hardly exceeds 25 mm. In one of these from Szechwan the length of the bill is: four adult males, 23.0–26.0 (25.0); five adult females, 24.0–26.5 (25.20). In the other series from Chinkiang the bill is: eight adult males, 24.0–26.0 (25.25); 14 adult females, 23.0–26.0 (24.35).

Another character, but of lesser value, is that of the crest. In more specimens of *brevirostris* the filaments of the crest are finely barbed instead of naked. In two adults from the "Mountains of western China" (no sex, date, or locality) the hair-like filaments are "filaments" no longer, but long, fully webbed plumes. These two specimens are exceptional.

But barbed filaments are also found in many adult specimens of the other two continental races, as well as in all the immatures. In this connection it is interesting to note that in another drongo, *Dicrurus paradiseus*, the wire-like shaft of the tail feathers does not become entirely denuded of barbs until the bird assumes the adult plumage. That this happens in birds other than drongos is also shown by Ogilvie-Grant in the case of *Cicinnurus regius claudii* (1915). So, despite the evident tendency in *brevirostris* to retain the barbs in the adult plumage, it does not seem to be a very reliable character to follow, as it is too often associated with the age of the bird.

Cabanis and Heine did not designate any type locality other than "China." Kloss (1921c) says that the type locality is "Chusan." I cannot place this locality, but as Kloss gives the range of *brevirostris* as being eastern China, Chusan may be the same as "Chushan" in northern Chekiang. It is not clear from the text whether Kloss means to appoint "Chusan" as the definite type locality, or is quoting a prior selection from another author. If the latter, I have been unable to find it in the literature.

THE RACES OF THE PHILIPPINE EXTENSION

These three races consist of *palawanensis* on Cagayan Sulu, Balabac, Palawan, and Calamianes, *cuyensis* on Cuyo and Semirara, and *menagei* on Tablas. Although some of the characters of these races differ rather widely from the particularly homogeneous races of the central group and the continent, I believe

that these three races were also derived from the same wave of expansion that gave rise to the other races of group C.

In the three Philippine races the tail is distinctly forked, not squarish, and the tips of the outer rectrices show only a very slight tendency to curl upward; this is especially true of *menagei* in which the fork is very deep, the shape of its tail and fork being similar to that of *densus* (Timor) from group B. The hackles and breast spangles in *palawanensis*, and particularly in *menagei*, are fewer and much smaller than in all the other races of group C, but in *cuyensis*, which is intimately related to *palawanensis*, they are identical to those of the other races of group C. The mantle in *palawanensis* and *menagei* is just as velvety, when seen from above, as the mantles of the races of the central group, but in *cuyensis* the nape and mantle are invaded by a few glossy reflections in a manner strongly reminiscent of *kühni* (Tenimber) from group B. There are no frontal filaments in any of the three Philippine races, but these are also lacking in some of the races of the central group. The feathering at the base of the bill is similar to that of the other races of group C, and so is the shape of the bill; there are slight differences but the bill remains of the same type, being just as pointed and compressed at the tip in *menagei* as in the continental races.

It can be seen from the above character analysis that, although some of the characters of the three Philippine races have become more or less aberrant, many have remained similar. This degree of similarity, as well as their geographical distribution, shows these races to have been derived from wave C by way of Borneo. The differences may be due to an early separation or, what is just as likely, isolation on the periphery of the range. Of the three races those (*palawanensis* and *cuyensis*) that occupy islands on the Sunda Shelf are still fairly close in appearance to *borneensis*; the race (*menagei*) that has left the Shelf to push on across Mindoro Strait is not only the most isolated but also the most distinct. Semirara Island is also north of the Shelf, but the measurements of the only specimen so far collected on this island show it to be not separable from the birds of Cuyo.

Dicrurus hottentottus palawanensis Tweeddale

Dicrurus palawanensis TWEEDDALE, 1878, Proc. Zool. Soc. London, p. 614. Puerto Princesa, Palawan Island.

Chibia cagayanensis MEARNS, 1909, Proc. U. S. Natl. Mus., vol. 36, p. 447. Cagayan Sulu Island. (Type in U.S.N.M.)

Differs from neighboring *borneensis* in having a little longer and more deeply forked tail, the four inner pairs of rectrices gradually getting longer, not ending on the same level, the tips of the outer pair showing but a very slight tendency to curl upward. Breast spangles considerably smaller. The metallic feathers of the crown extend in some, but not in all, specimens a little farther back to the nape. No frontal filaments. General coloration less bluish, blacker and duller and with the gloss greenish rather than purplish blue. Color of the iris is generally given as "brown," though Everett has written on a label "iris in the living bird deep crimson."

SPECIMENS EXAMINED: Cagayan Sulu, 1 ad. ♀ (the type of *C. cagayanensis*), 2 ad. ♂. Palawan: Puerto Princesa, 4 ad. ♂, 2 imm. ♂, 3 ad. ♀, 3 imm. ♀, 1 unsexed imm.; Malanao, 1 ad. ♀; Jaguso, 1 imm. ♀; Brooke's Point, 1 imm. ♂, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 21.5–23.0 (22.25); female, 22.0–22.5 (22.10). Wing, male, 140.0–143.0 (141.75); female, 134.0–137.0 (135.40). O.T.F., male, 117.0–133.0 (124.33); female, 115.0–120.0 (118.33). C.T.F., male, 101.0–105.0 (103.0); female, 103.0–113.0 (106.80). Depth of fork (average), male, 21.33; female, 11.55.

RANGE: Cagayan Sulu, Balabac (Everett), Palawan, Calamianes (Bourne and Worcester, McGregor).

DISCUSSION: In March, 1883, three males and one female were collected on Cagayan Sulu by Guillemard and referred by him (1885) to *pectoralis*. We have two of these specimens, both adult males. The wing and bill are shorter than in *pectoralis*, and these as well as the other measurements and general characters show that these specimens should be referred to *palawanensis* rather than to *pectoralis*. In seven adult males of *pectoralis* the wing measures 147.0 to 153.0 (151.31), and the bill, 23.5 to 25.0 (24.25); in four topotypic adult males from Palawan these

measurements are 140.0 to 143.0 (141.37) and 21.5 to 22.0 (21.87); in the two adult males from Cagayan Sulu they are 142.0 and 143.0 (142.50) and 23.0 and 23.0. Guillemard also noted that there were no frontal filaments on any of the Cagayan Sulu specimens. This character is true of *palawanensis* in which filaments are never present, whereas they are found in a little more than half of the specimens of *pectoralis*.

Mearns, in February, 1904, collected a single specimen on Cagayan Sulu and named the form of this island *cagayanensis*, describing it as "very similar to *Chibia palawanensis* differing only in its somewhat larger size, shallower forking of the tail, the narrower and very much smaller spangles on the breast, and in the absence of metallic green on the upper tail coverts." The measurements given above of topotypic adult males from both Cagayan Sulu and Palawan show that the two populations cannot be separated by measurements. The same thing is true of the females. The type of *cagayanensis*, an adult female, has a wing of 137, and Mearns says that the depth of its fork is 16, and that two other adult females measured by him from Cagayan Sulu have the wing 131, 133, and the fork 20, 20. In my specimens, three adult female topotypic specimens of *palawanensis* measure: wing, 134, 135, 136; fork, 12, 16, the third having the O.T.F. broken. In the topotypic males of *palawanensis* the depth of the fork is 12, 16, 18, 19.

Since the examination of all the specimens of both populations as a series also fails to show a difference in the shape and size of the breast spangles, or as to the amount of gloss on the upper tail coverts, and I have shown that their measurements are similar, and no distinguishing characters can be found, I consider *cagayanensis* to be a synonym of *palawanensis*.

Dicrurus hottentottus cuyensis McGregor

Chibia cuyensis MCGREGOR, 1903, Bull. Philippines Mus., no. 1, p. 5. Cuyo Island. (Type formerly in Philippines Mus., Manila.)

Chibia worcesteri MCGREGOR, 1905, Bur. Govt. Lab. (Manila), no. 34, p. 26. Semirara Island. (Type formerly in Govt. Lab. Collection, Manila.)

Similar to *palawanensis* but larger in every measurement and glossier, the hackles and

breast spangles being as large and as abundant as in *borneensis*. The metallic feathers of the crown are as large as those of *borneensis* and considerably larger than those of *palawanensis*, and more numerous than in both. They extend well onto the nape, farther back than in *palawanensis*, and as in *kühni* from Tenimber, glossy reflections spread irregularly from the hind neck onto the mantle. No frontal filaments. General coloration similar and with the gloss strongly greenish as in *palawanensis*. Color of the iris not indicated.

SPECIMENS EXAMINED: Cuyo Island, 4 ad. ♂, 2 ad. ♀, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 23.5–26.0 (24.37); female, 23.5, 24.0 (23.75). Wing, male, 151.0–155.0 (152.87); female, 148.0, 149.0 (148.50). O.T.F., male, 127.0–140.0 (133.50); female, 133.0, 133.0. C.T.F., male, 112.0–113.5 (112.50); female, 113.0, 114.0 (113.50). Depth of fork (average), male, 21.0; female, 19.50.

RANGE: Cuyo and Semirara Islands (Worcester).

DISCUSSION: Worcester in July, 1905, collected a single specimen on neighboring Semirara Island. This specimen, an adult male, was named *worcesteri* by McGregor who describes it as "Closely related to *Chibia cuyensis* McGregor, but with wing longer and outer tail feather much more recurved; similar to *Chibia palawanensis* Tweeddale, but tail longer and its outer feather more recurved, bill longer and deeper." Translated into metric equivalents the measurements given by McGregor for this specimen are: wing, 150, O.T.F., 136. Four adult males of *cuyensis* measure: wing, 151, 152, 153.5, 155 (152.87); O.T.F., 127, 131, 136, 140 (133.50).

I have not examined any specimen from Semirara, for the only specimen so far collected on this island seems to have been the type, which very unfortunately seems to have disappeared in the recent war during the siege of Manila. Examination of further Semirara specimens is much to be desired, for McGregor's statement as to the shape of the tail is very tantalizing. Semirara is off the Sunda Shelf and occupies a position intermediate between Tablas with its distinctive form (*menagei*) and the Calamianes and Cuyo Islands. Conceivably, the shape of the tail in

the birds of Semirara might also be intermediate between that of *menagei* and that of *palawanensis* on Calamianes and *cuyensis* on Cuyo. If so, *worcesteri* would of course be confirmed, but until other specimens are collected, I believe that it is best to consider it a synonym of *cuyensis*, since no other distinguishing characters are indicated and the measurements so far published are identical to those of *cuyensis*.

Dicrurus hottentottus menagei Bourns and Worcester

Chibia menagei BOURNS AND WORCESTER, 1894, Occas. Papers Minnesota Acad. Sci., vol. 1, no. 1, p. 15. Badajoz, Tablas Island. (Types in U.S.N.M.)

Differs from neighboring *palawanensis* and *cuyensis*, as well as from all the other members of group C, by its very long and very deeply forked tail (fig. 2, no. 9), the outer rectrices of which curve rather strongly outward but only slightly upward. All my specimens are very badly worn, but, as far as they show, the breast spangles are very small and scanty and the neck hackles small. The metallic feathers of the crown are as large as in the races of the central group of group C; they do not extend back to the nape as in *palawanensis* and *cuyensis*. No frontal filaments. Color of the iris "very dark brown," though whether of the living or dead bird is not stated.

SPECIMENS EXAMINED: Tablas Island, central Philippines, Badajoz, 1 ad. ♂, 1 ad. ♀ (the two "cotypes" of *C. menagei*), 3 ad. ♂, 4 imm. ♂, 2 ad. ♀, 1 imm. ♀ (the paratypes of *C. menagei*), 2 ad. ♂, 1 ad. ♀, 1 imm. ♀.

MEASUREMENTS: Length of bill, male, 24.0–25.0 (24.50); female, 23.0–24.0 (23.75). Wing, male, 140.0–145.0 (143.0); female, 139.0–142.0 (140.50). O.T.F., male, 164.0–192.0 (184.0); female, 177.0–183.0 (182.0). C.T.F., male, 111.0–117.0 (114.0); female, 112.0–118.0 (115.0). Depth of fork (average), male, 70.0; female, 67.0.

RANGE: Restricted to the Island of Tablas, Philippines.

DISCUSSION: The shape of the tail, so different from that of the other races of group C, was probably developed as a result of the great isolation of this form on the extreme

periphery of the range of the species. As we have seen, the shape of the tail in *hottentottus* is aberrant, or tends to be, in virtually all of the terminal races.

Hachisuka (1928) was unable to reconcile the long and deeply forked tail of *menagei* with the less forked tail with more curly tips which was supposed to characterize *Chibia*, and as a result he erected, for *menagei* only, a separate and new genus (*Dicrachibia*) to connect, as he says, *Dicrurus* to *Chibia*. Rensch (1931) promptly rejected this so-called new genus by showing that a similarly shaped, long, and deeply forked tail is found again in *Dicrurus h. densus* of Timor. *Chibia* had already been rejected by Hartert long before Hachisuka, and I have given, in the general discussion of the genera, ample reasons why in the Dicruridae the shape of the tail is too variable and inconstant a character to be used for generic separation.

DISCRURUS ANDAMANENSIS

ANDAMAN DRONGO

The Andaman Drongo is restricted to the Andaman Islands proper and to the small islands of Great Coco and Table immediately to the north. Two races are recognizable, differing from each other only somewhat in size; the smaller race, *D. a. andamanensis*, is found on the Andamans proper, and the larger, *D. a. dicruriformis*, on Great Coco and Table Islands. As no specimens of the latter were available, but since, outside of size, there are apparently no other differences, the description of the species is that of *D. a. andamanensis*.

Dicrurus andamanensis andamanensis Beavan

Dicrurus andamanensis BEAVAN, 1867, Ibis, p. 323. Andaman Islands.

General color black, with the exception of the primaries which are brownish, and the abdomen, flanks, and under tail coverts which are dull black or lustrous black; the whole of the plumage is glossed with dull metallic green. The wing linings are silvery brown and paler than the upper surface of the wing. On the feathers of the crown, hind neck, and the whole back, the gloss is limited to the tips and terminal edges of the feathers, resulting in a somewhat scaly appearance,

reminiscent of that of *annectans* though much less marked, the gloss of *andamanensis* being also duller. The feathers at each side of the neck are slightly elongated but are not developed enough to form hackles. On the lower throat and upper breast the gloss is more limited to the tips of the feathers and tends to form vague, ill-defined, and inconspicuous spangles.

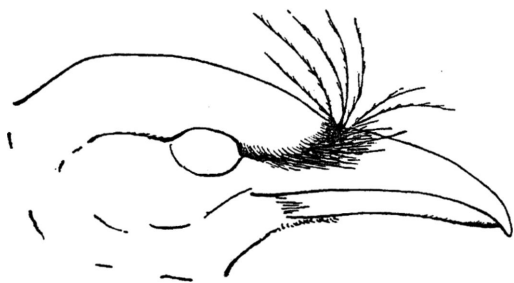


FIG. 13. Head of *Dicrurus a. andamanensis*.

From the frontal feathers at the base of the bill springs a tuft of hairy filaments about two-thirds of an inch long. These filaments are finely and distinctly barbed to their tips, some stand erect, others curving back towards the crown (fig. 13).

Tail long, deeply forked, shaped somewhat like that of *D. paradiseus lophorinus*, but differing from it in that the outer tail feathers are more pointed, less rounded at their tips, start to taper higher, and are much more strongly curved upward. In *andamanensis* also, the four inner pairs are each gradually longer than the other, whereas in *D. p. lophorinus* these feathers are almost even with each other, the four inner pairs of rectrices ending on virtually the same level.

Immatures duller, lacking the frontal filaments. With occasional traces, in some specimens, of white or buffy bars at the tips of the feathers on the abdomen and under tail coverts. White tips on the axillaries and under wing coverts, rather abundant and large, persisting, though smaller and fewer, in most adults.

SPECIMENS EXAMINED: Andaman Archipelago: South Andaman Island: Port Blair, 2 ad. ♂, 1 imm. ♂, 2 ad. ♀; Mt. Harriet, 3 ad. ♂; Gopla ka bung, 1 ad. ♂; Macpherson's Straits, 1 ad. ♀; no locality, 1 ad. ♂. Little Andaman Island, Bumila Creek, 2 ad. ♂, 1 subad. ♀, 1 unsexed ad.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 20.0–21.8 (21.0); female, 20.5–22.0 (21.10); whole culmen, male, 29.0–32.5 (31.42); female, 31.0–32.0 (31.33). Wing, male, 135.0–144.0 (137.55); female, 132.0–138.0 (135.33). O.T.F., male, 153.0–167.0 (160.22); female, 157.0–162.0 (158.66). C.T.F., male, 103.0–112.0 (108.56); female, 110.0–113.0 (111.66). Depth of fork, male, 47.0–58.0 (51.66); female, 46.0–50.0 (47.66). Length of crest, male, 11.0–25.0 (18.66); female, 13.0–17.0 (15.0).

RANGE: Andaman Islands.

DISCUSSION: Although the characters of *andamanensis* very clearly show that it has had a common origin with, and belongs to, the same group that includes *D. hottentottus* and *D. paradiseus*, the fact that these characters are to a certain extent intermediate is very provocative. The crest of *andamanensis*, though much less evolved than that of *D. hottentottus*, is very similar, but the rest of the plumage is like that of *D. paradiseus*. *D. andamanensis* lacks the racket tail of the latter, but the shape of the tail in *andamanensis*, though not identical with, is not too far removed from, that of *D. p. lophorinus*. However, when the evolution of the crest and of the racket tail is studied in both *hottentottus* and *paradiseus*, we find that in the more "primitive" races of these two species the crest is lacking, and in the case of *paradiseus*, a significant number of specimens either lack the racket or show some "aberration" of the outer tail feathers. In both cases, these more "primitive" races are located near the center from which these two species appear to have originated. In the case of *hottentottus*, in the southern Philippines and northern Moluccas, and in the case of *paradiseus*, in Borneo.

From the Moluccas, *hottentottus* has spread in all directions, but, significantly or not, is not found on the Malay Peninsula south of northern Tenasserim; *paradiseus* expanded only westward and is very well established on the Malay Peninsula and all the surrounding islands.

If the crest and rackets, then, are discounted as being secondary developments, we find that *andamanensis* is a simpler form of *paradiseus*; it is not a simpler *hottentottus*, for even in the simplest forms of *hottentottus* the back lacks gloss and is dull or velvety, and

the bill is feathered differently. I believe, therefore, that *andamanensis* was probably derived from the same ancestral form from which *paradiseus* developed. The present day distribution of *hottentottus* and *paradiseus* tends to support this view.

If this is assumed to be correct, it is not hard to visualize *andamanensis* as an early offshoot from ancestral *paradiseus*, which, having reached the Malay Peninsula from Borneo, crossed over to the Andamans and from there to Ceylon. The proof of such a possibility is shown by the presence of a typical race of *paradiseus*, with very well-developed racket tail, on the Andamans. This form (*D. p. otiosus*) has a short or rudimentary crest but otherwise differs only slightly in size from the races of the continent, from which it has obviously reached the islands. There is also another typical race of *paradiseus* on Ceylon, but in this case, this form (*D. p. ceylonicus*) reached Ceylon from India. There were then two separate invasions; the first gave rise to *andamanensis* on the Andamans and to *D. p. lothorinus* on Ceylon. In the Andamans the older population had successfully developed reproductive isolation by the time that the second invasion, which gave rise to *D. p. otiosus*, arrived. But in Ceylon this mechanism, apparently, failed to be perfected, and we have the interesting situation of having two races of *paradiseus* (*lothorinus* and *ceylonicus*) on the same island. These two races occupy separate zones, and the differences in their ecological requirements are known, but in the case of the Andamans the only available information so far, that of Baker (1933), is inconclusive.

The crest of *andamanensis* is more primitive but resembles that of certain races of *hottentottus*, but *andamanensis* is not related to these forms. It appears to be a case of parallel evolution, for there is in all drongos a tendency for the frontal feathers to be elongated, and the crest as a result has been developed independently several times. The crest appears to be characteristic of the *hottentottus*, *andamanensis*, and *paradiseus* group, but it is also found in another form which belongs to an entirely unrelated group, namely, *D. forficatus* of Madagascar.

Another possibility is that the crest of *andamanensis* is a case of introgressive

hybridization. A certain number of *hottentottus* might have found their way to the Andamans and, while none are found there today, their presence at one time might be responsible for the few short hairy filaments of *andamanensis*, whose plumage otherwise resembles that of *paradiseus*.

Dicrurus andamanensis dicruriformis Hume

Dissemuroides dicruriformis HUME, 1872, Stray Feathers, vol. 1, no. 1, p. 408. Great Coco and Table Islands.

Similar to *andamanensis* but larger.

Specimens not available for examination.

RANGE: Great Coco and Table Islands, north of the Andamans.

DISCUSSION: Hume in describing this new form said that it differed only in size from *andamanensis* but that "... difference is so great." Baker (1924, p. 372) also says, "Only differs from the preceding bird in being much bigger."

The wing length of Hume's 19 specimens from Great Coco and Table Islands measured 5.6 to 5.9 inches, or 142.34 to 149.86, no average given. Baker's specimens were even larger, measuring 142.0 to 156.0, no average given. My adult specimens of *D. a. andamanensis* from the southern half of the archipelago (South and Little Andamans) measure for the wing: nine males, 135.0–144.0 (137.55); three females, 132.0–138.0 (135.33). The same specimens measure for the O.T.F.: male, 153.0–167.0 (160.22); female, 157.0–162.0 (156.0). Hume does not give the measurement of the tail, and in Baker's specimens of *dicruriformis*, the O.T.F. measured 150.0 to 182.0, no average given.

The published measurements of *dicruriformis* given above show that this form is indeed larger than *andamanensis*, but the difference, particularly in the length of the wing, does not appear to be so great as it is claimed to be by Hume and Baker.

DICRURUS PARADISEUS

GREATER RACKET-TAILED DRONGO

The range of the Greater Racket-tailed Drongo extends through the Indo-Malayan region from Borneo and Java to India and Ceylon. On the continent the northern bound-

ary is along the lower slopes of the Himalayas from Kashmir to Yunnan. Off the continent the distribution coincides almost exactly with the islands on the continental shelf, except that the species is missing on Bali, Palawan, and the southern group of the western Sumatran islands. In addition to the islands on the shelf it is also found on Simalur, Nias, the Andamans, and the Nicobars. The complete range is shown in figure 14.

Through the whole of this great region this drongo varies so much geographically that it has been split into many races. In Baker's revision (1918), which did not include the populations of some of the outlying islands, 10 races were recognized. In Oberholser's list (1932), which covered the whole of the range, this number was increased to 22. In the present revision 14 races are recognized. The material used consisted of 455 specimens from all parts of the range, with the exception of Banguay and Balambangan Islands off northern Borneo, and included all of Oberholser's types and paratypes.

Examination of this material shows, as was noted by Baker, that there is a parallel clinal decrease in size from north to south in both the western and eastern parts of the range. This parallelism is of course not absolutely exact, but the races from Ceylon on the one hand and those from the Malay Peninsula on the other approach very closely, and it becomes impossible to separate the populations of southern India from those of southern Siam, and those of central India from those of southern and central Burma.

Curiously enough, this parallelism is not confined to the mainland, for the populations from the Andamans in the west and those from the Anambas on the east are also very close.

Thanks, however, to some combination of characters such as measurements and form of the crest, or its presence or absence, some of the 14 races can be easily differentiated, but many are merely dimensional and, as exact intermediates are found grading into each other, it becomes a question where to place the step in the cline. Furthermore, the island races from the Anambas, Natunas, Nicobars, Borneo, and Banguay are so close to one another or to other mainland races in meas-

urements and other characters that I feel that the study of larger and better series would probably reduce the number of truly distinct races still further.

In connection with this, the remark of Hume takes on special importance. After studying very large series, he points out (1878, p. 221) that individual variability in this species is so great that "nothing can be made out of a few isolated specimens from each locality." This applies with special emphasis to Oberholser who at one time or another described no fewer than 11 new races, often on the basis of a single specimen or on small or otherwise inadequate series.

Since there is no difference in color and so many of the races, except for the variations in the crest, can be separated only on the basis of measurements, these, in view of the great amount of individual variation, should be discussed.

The least variable, and therefore the most reliable, are those of the bill, C.T.F., and wing. The length of the crest and racket varies as much as 20 per cent but is more reliable than the length of the O.T.F. where variation is at its greatest. Equally unreliable, but for a different reason, is the width of the racket, for the rami are seldom undisturbed, and there is too much danger of spreading the racket in rearranging the feathers. However, the relative width of the racket and the relative length of the O.T.F. can be used, if not the actual measurements. Completely unreliable and so worthless that it is excluded from my measurements is the length of the denuded shaft, the barbs almost never ending abruptly and sometimes tapering so much and so gradually as to make accurate measurements impossible. This unfortunately applies, but to a lesser degree, to the proximal end of the racket, and the length of the racket therefore should be measured only from the point at which the rami of normal length start; in the fully adult there is usually at this point a little constriction from which the measurement can be taken.

It should again be emphasized that, especially in this most variable of all the drongos, the measurements used for discrimination should only be those of perfectly adult specimens. Specimens that still show traces of

white tips on the feathers of the abdomen or on the under tail coverts are at best only sub-adult. Since the perfect form and dimensions of the crest and rackets are attained only in the truly adult, and this also applies to the length of the wing and tail feathers, the remark of Kloss (1918, p. 228) that he regards such birds as "practically adult" is therefore very misleading.

With the use of two of the least variable measurements, as well as those of the chief characters of the species (racket and crest), the measurements of the 14 races are given in table 11. The specimens are only males and are all fully adult.

It will be noticed that in table 11 the order of the races starts with the small uncrested races of Borneo (*brachyphorus*) and Banguey

identical to that of *D. balicassius* from the Philippines. In *microlophus* these frontal feathers are a little shorter and do not curve so far forward and some, though still bristly, begin to point upward (fig. 14, no. 3).

Equally significant in *brachyphorus* are the shape of the bill and a well-marked tendency for the O.T.F. to become aberrant. In *brachyphorus* the shape of the bill is closer to the shape of that of *D. balicassius* than it is to the races of *paradiseus* from farther north. In *brachyphorus* also, a number of specimens are found in which there is some abnormality in the development of the O.T.F., one or both of these feathers being webbed throughout their length and therefore lacking the racket. These specimens are occasionally found in other races of *paradiseus*, but such specimens,

TABLE 11

COMPARATIVE MEASUREMENTS OF ADULT MALES IN THE RACES OF *D. paradiseus*

Race	N	Wing	C.T.F.	Racket	Crest
<i>brachyphorus</i>	13	138.0-147.0 (142.55)	115.0-125.0 (116.37)	44.0- 57.0 (51.50)	None
<i>banguey</i> ^a	9	146.0-152.0 (150.55)	—	—	None
<i>microlophus</i>	3	165.0 (1 specimen)	131.0-144.0 (137.66)	84.0- 92.0 (88.66)	None
<i>platurus</i>	30	140.0-160.0 (151.05)	116.0-135.0 (126.48)	60.0- 87.0 (70.50)	Tuft or trace ^b
<i>formosus</i>	12	142.0-152.0 (147.92)	123.0-134.0 (128.22)	90.0-108.0 (97.00)	10.0-20.0 (15.41)
<i>hypoballus</i>	9	144.0-152.0 (147.56)	115.0-139.0 (124.13)	67.0- 80.0 (74.50)	12.0-22.0 (15.56)
<i>paradiseus</i>	50	154.0-167.5 (159.38)	127.0-149.0 (137.69)	76.0-111.0 (88.73)	15.0-32.0 (24.16)
<i>rangoonensis</i>	7	163.0-172.5 (167.57)	138.0-156.0 (146.25)	86.0-108.0 (95.00)	31.0-55.0 (42.50)
<i>grandis</i>	6	175.0-185.0 (181.25)	145.0-162.0 (157.33)	96.0-112.0 (103.40)	54.0-66.0 (58.33)
<i>johni</i>	10	162.0-180.0 (168.10)	136.0-158.0 (144.25)	80.0- 98.0 (88.70)	47.0-57.0 (52.40)
<i>ceylonicus</i>	5	150.0-156.0 (152.25)	130.0-138.0 (132.75)	74.0- 89.0 (79.25)	17.0-29.0 (22.00)
<i>lophorinus</i>	7	140.0-150.0 (145.72)	125.0-131.0 (128.14)	None	9.0-15.0 (12.50)
<i>otiosus</i>	5	162.0-169.0 (164.75)	136.0-158.0 (144.25)	88.0-107.0 (98.25)	None or trace ^c
<i>nicobariensis</i>	4	155.0-164.0 (159.75)	127.0-138.0 (133.25)	75.0- 81.0 (77.66)	22.0-29.0 (26.00)

^a Measurements from original description; tail, racket, and crest said to be "like" those of *D. p. brachyphorus*.

^b Crest present in nine specimens out of 30 measures 10.0 to 18.0 (11.0).

^c Crest present in two out of five specimens measures 14.0 and 15.0.

(*banguey*), which are then followed by the uncrested race of the Natunas, Anambas, and Tiomans (*microlophus*), and the almost uncrested race of the tip of the southern Malay Peninsula and Sumatra (*platurus*). From there on northward the crest becomes more and more developed. In all the crested races of *paradiseus* the frontal feathers are webbed and are elongated *upward and backward* to form the crest; in *brachyphorus* and in *banguey* the frontal feathers are elongated *forward* and consist not of webbed feathers but of bristly little plumes which curl over the ridge of the culmen (fig. 14, no. 1), the feathering of the bill in these two races being

with the exception of the hybrids between *lophorinus* and *ceylonicus*, are rare; in *brachyphorus* on the other hand, where there is no possibility for hybridization, they appear much oftener (in six out of my 32 specimens of both sexes, adults as well as immatures).

The appearance of these "aberrant" characters in *brachyphorus*, namely: no crest but development of the frontal feathers similar to that of *D. balicassius*, bill intermediate in shape between that of the latter and of *D. paradiseus* from farther north, the persistent appearance of tail feathers without rackets as well as the generally poorly developed racket (very short and very narrow) charac-

teristic of *brachyphorus* as a whole, strongly suggests that *D. paradiseus* is not too far removed from *D. balicassius* and was derived from the same population that gave rise to *D. balicassius*.

It is probable that *D. paradiseus* arrived in the Malay Archipelago (Borneo) from the

GENERAL DESCRIPTION OF THE SPECIES

General color black, the whole of the plumage excepting the quills, lower abdomen, and flanks glossed with fairly strong metallic steel blue or greenish blue, a trace of gloss appearing on the edges of the feathers of the crest, if present, and on the outer web of the

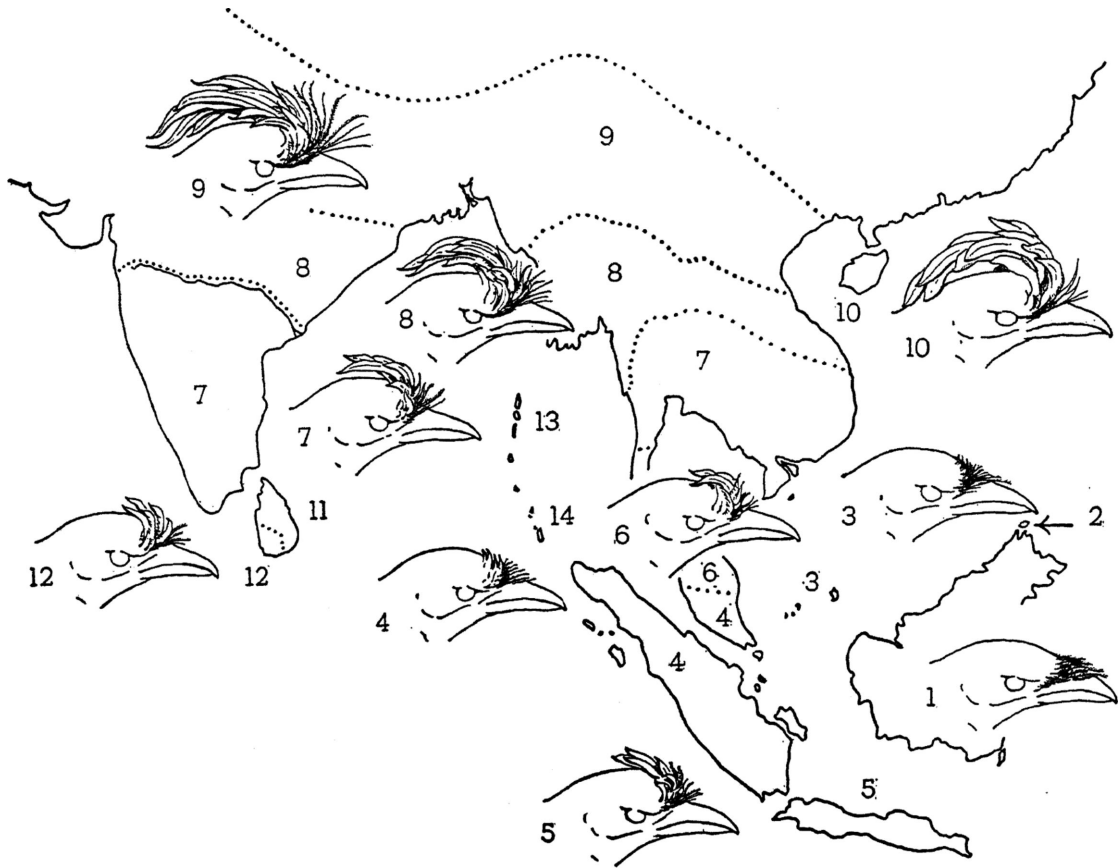


FIG. 14. Distribution of *Dicrurus paradiseus* and evolution of its crest. 1. *D. p. brachyphorus*. 2. *D. p. banguay*. 3. *D. p. microlophus*. 4. *D. p. platurus*. 5. *D. p. formosus*. 6. *D. p. hypoballus*. 7. *D. p. paradiseus*. 8. *D. p. ragoonensis*. 9. *D. p. grandis*. 10. *D. p. johnei*. 11. *D. p. ceylonicus*. 12. *D. p. lothorinus*. 13. *D. p. otiosus*. 14. *D. p. nicobariensis*.

Philippines; from Borneo the expansion proceeded to the southern Malay Peninsula via the Natunas, Anambas, and Tiomans, and from the southern Malay Peninsula to Sumatra, as well as to the north and to the Nicobars and Andamans. The Javan race (*formosus*) was undoubtedly derived from Sumatra but has developed the crest and large rackets of the northern races.

primaries and rectrices. On the feathers of the crown and mantle the gloss is limited to the tips and terminal edges of the feathers and gives a scaly appearance, though the glossy part is broad and, when the feathers are correctly arranged, the glossy surface of the upper parts appears more or less smooth and unbroken. On the throat and upper breast, on the other hand, the gloss is much more

restricted, the glossy tips are much narrower, and being separated from one another tend, to a varying degree, to form spangles reminiscent of those of *hottentottus* but less sharply defined.

The feathers at the sides, as well as all around the hind neck, are more or less prolonged, and when well developed form a glossy cape that covers the shoulders. The frontal feathers in most races are elongated upward and backward to form a crest, the main feathers of which are fully webbed and, depending on their length, which varies from race to race, curl backward from just over the forehead to well beyond the nape.

The outer tail feathers are greatly prolonged beyond the others, and in all races but one (*lophorinus*), which lacks the racket in all plumages, their inner web, from about the level of the third pair, tapers off more or less gradually, the shaft becoming completely denuded of barbs for a varying distance until the inner web reappearing rather abruptly forms a broad terminal racket. The shaft itself twists in a long spiral carrying the racket outward, curving its edge inward and curling its tip completely around.

Subadults are less glossy, the crest when present is not so well developed, and the rackets are smaller and not so curly, the shaft itself often showing traces of barbs. The under tail coverts, and occasionally also the feathers of the abdomen, are fringed narrowly with terminal white. The axillaries are tipped with white, these white tips still persisting, though much smaller and much fewer, in otherwise perfectly adult birds.

Immatures are browner, less glossy; the white fringes on the feathers of the abdomen and under tail coverts and the white tips of the axillaries are broader and much more abundant. The O.T.F. are very much shorter; the shaft does not spiral and retains a narrow fringe of barbs on the inner side, or is indented but fully barbed, and the racket itself is poorly developed. If a crested race, the crest is rudimentary.

Dicrurus paradiseus brachyphorus Bonaparte

Edolius brachyphorus BONAPARTE, 1850, *Conspectus generum avium*, vol. 1, pt. 1, p. 351. Borneo.

Dissemurus paradiseus insularis HACHISUKA,

1926, *Bull. Brit. Ornith. Club.* vol. 47, p. 58. Sarawak, Borneo. (Type in British Mus.)

Crestless, the frontal feathers not being developed upward but prolonged forward as bristly little plumes which curl forward over the ridge of the culmen (fig. 14, no. 1). The pointed feathers of the sides and hind neck very poorly developed. The glossy tips of the breast feathers not pointed and forming only the vaguest sort of ill-defined spangles. This form, in every measurement, is the smallest of all the races of *paradiseus*, the rackets especially being smaller and much narrower.

SPECIMENS EXAMINED: Southern Borneo: Sampit River, Parit, 2 ad. ♂, 1 imm. ♀; Riam, 1 ad. ♂, 1 ad. ♀, 1 imm. ♀. Southeastern Borneo, Pulo Laut, 1 ad. ♂, 1 subad. ♀. Eastern Borneo: Segah River, 2 ad. ♂, 1 subad. ♀; Labanan, near Segah River, 1 ad. ♂; Birang River, Beraoe, 1 subad. ♀; Laboeankelamboe, 1 ad. ♂; Sungei Menganne, 1 subad. ♂, 1 subad. ♀; Sungei Ritan, 1 imm. ♀; Sungei Karangan, 1 ad. ♂; Sungei Pelawan, 1 imm. ♀; Karang Tigan, 1 ad. ♀; Lo Bon Bon, 1 ad. ♂ (?). Central Borneo, no locality, 1 subad. ♂, 1 imm. ♀. Western Borneo, Kapuas River, Sanggau, 1 ad. ♂. Sarawak: Lawas, 1 ad. ♂; Benkoka, 1 subad. ♀, 1 unsexed ad.; Trusan, 1 imm. ♀; Baram district, 1 unsexed ad. Borneo: Sapagaya River (not located), 1 ad. ♂; no locality, 1 unsexed ad., 1 unsexed subad.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 19.0–22.0 (20.84); female, 19.0, 20.0; whole culmen, male, 28.0–32.0 (30.0); female, 28.5, 29.0. Wing, male, 138.0–147.0 (142.55); female, 134.0–139.0 (136.66). C.T.F., male, 115.0–125.0 (116.37); female, 113.0, 114.0. O.T.F., male, 260.0–336.0 (301.36); female, moulting. Length of racket, male, 44.0–57.0 (51.50). Width of racket, male, 14.0–18.0 (16.33). Crest, none.

RANGE: The whole of Borneo, including Pulo Laut.

DISCUSSION: Shortly after its publication, *D. p. insularis* Hachisuka was withdrawn by its author as equaling *brachyphorus* (p. 75 of the same publication in which it was described).

My series shows no discernible difference between the various populations. However, Mayr (1938b) reports a population from southern Borneo as tending to be larger than the birds of northern Borneo. This population

from Riam and Parit measures for the wing, adult males: 138, 140, 140, 142, 145, 147 (142.0). I have no material from northern Borneo, but Chasen and Kloss (1930) give the wing length in a series of 12 males from near Sandakan in northern Borneo as 130, 131, 131, 133, 134, 134, 137, 139, 139, 140, 140, 140 (135.66). These measurements are certainly smaller than those of the southern birds mentioned by Mayr. But apparently there is no difference between the southern birds and those of Sarawak; my only adult male from this region has a wing of 144, and seven other specimens from Sarawak are reported by Chasen and Kloss (1930, p. 97) as having "wings 142-145 and one 150 mm."

Dicrurus paradiseus banguey Chasen and Kloss

Dissemurus paradiseus banguey CHASEN AND KLOSS, 1929, Jour. für Ornith., suppl. 2, p. 120. Banguey and Balambangan Islands, off northern Borneo.

Similar to neighboring *brachyphorus* but with a somewhat longer wing.

Specimens not available for examination.

RANGE: Banguey and Balambangan Islands off northern Borneo.

DISCUSSION: This race is described as being larger but otherwise just like *brachyphorus*. The measurements upon which it is based are, as given by the authors, wing: male, Banguey, 152, 152, 152, 158 (153.50); Balambangan, 146, 147, 147, 148, 153 (148.20), female, 148.0; average of the wing length in both populations, male, (150.55). The authors state that this is as "against 127-145 (once 150) in seventy specimens of *brachyphorus*."

In my series of 13 adult males from all over Borneo, except the northern end, the wing measures 138.0 to 147.0 (142.55). The difference between the average measurement of these birds and that of those of Balambangan is 5.65, a similar difference (5.30) existing between the latter and those of Banguey. In view of this fact, I wonder if any purpose can be served by recognizing such small local dimensional differences, particularly when there are no other distinguishing characters. However, since Chasen and Kloss in another paper (1930) report a series of 12 males from the near-by region of Sandakan as measuring

only 130.0 to 140.0 (135.66), the gaps between the population of this region of Borneo and the populations of Banguey (17.84) and Balambangan (12.54) may be considered sufficiently great to admit *banguey* as a separate race.

Dicrurus paradiseus microlophus Oberholser

Dissemurus paradiseus microlophus OBERHOLSER, 1917, Bull. U. S. Natl. Mus., no. 98, p. 59. Pulo Jimaja, Anamba Islands. (Type in U.S.N.M.)

Dissemurus paradiseus endomychus OBERHOLSER, 1932, Bull. U. S. Natl. Mus., no. 159, p. 98. Pulo Lingung, Natuna Islands. (Type in U.S.N.M.)

Considerably larger in every way than neighboring *brachyphorus*. Like it crestless, but the frontal feathers not extending quite so far forward; a few of these feathers are more developed and show a tendency in some specimens to point upward and to form a short bushy tuft (fig. 14, no. 3). The pointed feathers of the sides and hind neck longer; the gloss on the breast feathers more restricted to the tips of the feathers, and more pointed, tends to form spangles.

SPECIMENS EXAMINED: Anamba Archipelago: Pulo Djimaja, 1 ad. ♂ (the type of *D. p. microlophus*); Pulo Mobur, 1 subad. ♂; Pulo Piling, 1 imm. ♂, 2 imm. ♀; Pulo Siantan, 2 ad. ♂, 1 subad. ♂, 1 imm. ♂; Pulo Telaga, 1 ad. ♀; Pulo Riabu, 1 ad. ♀ (the paratypes of *D. p. microlophus*).

Natuna Archipelago: Pulo Lingung, near Bunguran, 1 subad. ♂ (the type of *D. p. endomychus*), 1 subad. ♂, 1 imm. ♂; Bunguran or Great Natuna Island, 1 imm. ♀ (the paratypes of *D. p. endomychus*); Bunguran, 4 subad. ♂, 1 subad. ♀, 3 imm. ♀.

Pulo Tioman: 4 ad. ♂.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 23.0-24.5 (23.83); female, 22.5, 23.0; whole culmen, male, 34.0-36.0 (34.66); female, 33.0, 34.0. Wing, male, 165.0; female, 157.0. C.T.F., male, 131.0-144.0 (137.66); female, 124.0. O.T.F., male, moulting; female, moulting or not adult. Length of racket, male, 84.0-92.0 (88.66). Width of racket, male, 22.0, 23.0. Crest, male, two, none, one tuft 12.0; female, two, none.

All the measurements are those of the Anamba specimens; those of the Natunas are not given, as none is adult. The measure-

ments of the four adult male Tioman specimens are given individually as follows:

Length of bill, from anterior border of nostril, 22, 22, 22, 22; whole culmen, 32, 32, 33, 33. Wing, 144.0+ (moult), 151.5, 152.5, 162.0. C.T.F., 125, 128, 129, 131. O.T.F., 374.0+ (moult), 378.0+ (moult). Length of racket, 73, 75, 76, 77. Width of racket, 20, 21, 22. Crest, none in three, one tuft 10.0.

RANGE: Anamba and northern Natuna archipelagoes, possibly also the Tioman Archipelago.

DISCUSSION: Despite its size the series is inadequate, as the large majority of the specimens is not adult and all without exception are in varying stages of the moult. The series includes all of Oberholser's original material, plus eight additional specimens from the Natunas, and four from the Tiomans.

Oberholser separated the Natuna population from that of the Anambas on the ground that the so-called new form (*endomychus*) differed by having a longer tail and shorter racket. Although Oberholser gives the type and one of his other specimens, as being adults, none is adult, including unfortunately all of my own additional specimens. As far as the specimens go, there is no difference between the two populations. In none of the adult Anamba birds have the tails reached their full length, as they are still moulting, but the rackets have, and they measure 84.0 to 92.0 (88.66). In one of the subadult Natuna specimens in which the tail already appears to be adult, the racket is not shorter, as it measures 86.0.

The other character ascribed to *endomychus*, crest "denser [and] more bushy," is not particularly diagnostic either. In fact, the Natuna specimens do not differ from those of the Anambas, or for that matter from a great many specimens of *platurus*. I believe therefore, at least until two good series made up of fully adult specimens can be compared, that *endomychus* is synonymous with *microlophus*.

Chasen (1935, p. 307) remarks in a footnote that "The races are curiously mixed in the Tioman Archipelago and some birds could be equally well referred to *platurus*." In the case of my specimens the wing measurements show a good deal of variation. The two smaller birds cannot be distinguished

from *platurus* by this or any other character. On the other hand I have not measured a specimen from the southern Malay Peninsula or Sumatra with a wing as long as 162 mm. If a large series from the Tiomans showed such a measurement to be exceptional, the birds from these islands could perhaps be best referred to *platurus*.

Dicrurus paradiseus platurus Vieillot

Dicrurus platurus VIEILLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 588. Based on "le Drongo à Raquette," Levaillant, 1805, Oiseaux d'Afrique, vol. 4, p. 73, pl. 175. Restricted to Malacca and Sumatra by Tweeddale, 1877, Ibis, p. 314; type locality fixed to Malacca proper by Robinson and Kloss, 1920, Jour. Straits Branch Roy. Asiatic Soc., no. 81, p. 111.

Dissemurus paradiseus olizurus OBERHOLSER, 1912, Smithsonian Misc. Coll., vol. 60, no. 7, p. 15. Simalur Island, western Sumatra. (Type in U.S.N.M.)

Dissemurus paradiseus adelphus OBERHOLSER, 1912, loc. cit. Teliwaa, Nias Island, western Sumatra. (Type in U.S.N.M.)

Dissemurus paradiseus pachistus OBERHOLSER, 1912, *ibid.*, vol. 60, no. 7, p. 16. Pulo Lasia Island, western Sumatra. (Type in U.S.N.M.)

Dissemurus paradiseus elassopterus OBERHOLSER, 1912, loc. cit. Pulo Babi Island, western Sumatra. (Type in U.S.N.M.)

Dissemurus paradiseus messatus OBERHOLSER, 1926, Jour. Washington Acad. Sci., vol. 16, no. 19, p. 519. "Selitar, 9 miles from the town of Singapore," Singapore Island. (Type in the U.S.N.M.)

Dissemurus paradiseus siakensis OBERHOLSER, 1926, loc. cit. Siak River, eastern Sumatra. (Type in U.S.N.M.)

Dissemurus paradiseus colpiotes OBERHOLSER, 1926, *ibid.*, vol. 16, no. 19, p. 520. Loh Sidoh Bay, northwestern tip of Sumatra. (Type in U.S.N.M.)

Larger than *brachyphorus*, the tail longer, the racket longer and broader. A little glossier, the glossy feathers of the breast definitely arranged into spangles. The pointed feathers at the sides and hind part of the neck forming a short but definite cape. The frontal feathers (fig. 14, no. 4) elongated slightly forward but mostly upward, forming in the large majority of the specimens a more or less developed bushy tuft, and in the other specimens a very short crest which, when best developed, curves backward to the forehead.

SPECIMENS EXAMINED: Southern Malay Peninsula, south of latitude 4° N. Pahang: Gunong Tahan, 2 imm. ♂; Tanjang Malim, 2 ad. ♂; Rompin River, 1 imm. ♀; Sungir Lebeh, "Pahang" (not located), 2 ad. ♂. Selangor, no locality, 1 unsexed nestling. Malacca, 1 ad. ♂, 1 unsexed imm. Singapore Island, Selitar, 1 ad. ♂ (the type of *D. p. messatus*), 1 subad. ♀, 2 imm. ♀ (the paratypes of *D. p. messatus*).

Sumatra: Northwestern tip, Loh Sidoh Bay, 1 ad. ♂ (the type of *D. p. colpiotes*). Northeastern Sumatra: Delitoea, 1 ad. ♂, 1 ad. ♀, 1 subad. ♀; Toentoengan, 3 ad. ♂, 2 subad. ♀; Polonia, 1 ad. ♂, 1 imm. ♀; Tandjong Morawa, 1 ad. ♂, 1 imm. ♀; Deli district, no locality, 1 ad. ♂, 1 ad. ♀. Sumatra, no locality, 3 ad. ♂, 1 imm. ♂, 1 ad. ♀, 1 subad. ♀, 3 imm. ♀, 1 unsexed subad. Eastern Sumatran islands: Pulo Rupert, 1 imm. ♀. Siak River, 1 ad. ♂ (the type of *D. p. siakensis*). Great Karimon Island, 1 ad. ♀. Lingga Island, 1 ad. ♂, 1 ad. ♀, 1 unsexed ad. Bangka Island, Tandjong Pamuja, 1 imm. ♀.

Western Sumatran islands: Simalur Island: 1 ad. ♂ (the type of *D. p. olizurus*), 1 ad. ♂, 2 ad. ♀, 1 subad. ♀, 1 imm. ♀ (the paratypes of *D. p. olizurus*). Pulo Lasia, 1 ad. ♂ (the type of *D. p. pachistus*), 2 ad. ♂ (the paratypes of *D. p. pachistus*). Pulo Babi, 1 ad. ♂ (the type of *D. p. elassopterus*), 1 subad. ♂, 1 subad. ♀ (the paratypes of *D. p. elassopterus*). Nias Island: Teliwaa, 1 ad. ♂ (the type of *D. p. adelphus*), 1 subad. ♀; Siaba Bay, 2 ad. ♂, 1 ad. ♀; Lafau, 1 subad. ♀ (the paratypes of *D. p. adelphus*).

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 20.0–24.0 (22.27); female, 20.5–23.0 (21.65); whole culmen, male, 30.0–37.0 (33.40); female, 31.0–36.0 (32.86). Wing, male, 140.0–160. (151.05); female, 142.0–152.0 (148.25). C.T.F., male, 116.0–135.0 (126.48); female, 125.0–137.0 (128.25). O.T.F., male, 309.0–384.0 (350.0); female, 278.0–363.0 (308.0). Length of racket, male, 60.0–87.0 (70.50); female, 59.0–80.0 (71.0), one additional, 93.0. Width of racket, male, 16.0–23.0 (19.21); female, 16.0–24.0 (19.33). Crest, southern Malaya, male, one, none; five, 10.0–18.0 (14.40); Sumatra, male, 18, none; four, 10.0–12.0 (11.0); female, seven, none; one, 12.0.

RANGE: Southern end of the Malay Peninsula from about latitude 4° N., Singapore Island, and possibly the Tioman Archipelago; the whole of Sumatra including the eastern coastal islands, Rhio and Lingga

archipelagoes, Bangka Island; the northern group of the western Sumatran islands including Simalur, Lasia, Babi, and Nias.

DISCUSSION: The troublesome origin of the specimen described and depicted by Levaillant and upon which Vieillot's *platurus* is founded has been very clearly discussed by Tweeddale (1877). He shows conclusively that Levaillant did not depict the same specimen figured and described by Sonnerat as having come from the coast of Malabar and which received the title of *malabaricus* from Latham, later altered to *retifer* and *setifer* by Temminck.

There is no need to repeat Tweeddale's sound arguments; they were fully accepted by Robinson and Kloss (1920), and I too am in complete agreement.

Kloss in another paper (1931, p. 359) states that after having examined "... material from East, West, North and South Sumatra... I cannot separate the birds from the various localities from each other, nor those of Sumatra as a whole from the birds of the southern half of the Malay Peninsula." Oberholser had proposed for populations within this range, the names of *messatus* for the birds of Singapore Island, *siakensis* for eastern, and *colpiotes* for western Sumatra.

Junge (1936), after examining specimens from Simalur (*olizurus*) and Pulo Babi (*elassopterus*), shows that their measurements fall within the variation range of the Sumatran birds and states he cannot point to any other characters which would separate the birds from these two islands from birds of Sumatra proper.

Ripley (1944) examined Oberholser's specimens and agrees with Junge. He shows that the specimens from Pulo Lasia (*pachistus*), not mentioned and presumably lacking by Junge, are not separable either.

This leaves but one of Oberholser's races, *adelphus* from Nias, and this latter is recognized by Ripley (1944) because the Nias specimens are larger than any measured by Kloss (1931). However, after examining these Nias specimens and employing the wing length as used for discrimination by Kloss, Junge, and Ripley, I find that three adult males from Nias measure 153, 156, 156; three adult males from Lasia 153, 153, 155.

This is a difference in average of only 1.34 mm., amounting to less than 1 per cent of the wing length. In addition I have measured adult specimens from the southern Malay Peninsula with a wing length of 153, a male from Deli and still moulting with 151, and several others from Sumatra with the same wing length, including a female, one male from Lingga Island with 155, and one unsexed adult from the same locality with 160.

Furthermore, there is no good reason why only the wing length should be used. Other measurements which vary but little, such as bill length and central tail feather, also overlap. I feel therefore that since *adelphus* also falls within the range of variation of some of the other populations and cannot be further distinguished by any other character, it too should join the others in the synonymy of *platurus*.

Except for the size difference, which is offered as being the leading character in most of the proposed races, the other characters as used by Oberholser, such as the shape and size of the crest, are not diagnostic, since the birds do not really have a crest. As far as the small differences in shape or size of the rackets are concerned, I agree with Junge (1936) that even if the rackets were all in the same state of wear, which they are not, this would be of very dangerous taxonomic value in a form that shows so much individual variation. Further, the size of the sample should be considered; it is far too small for such a variable form, the new races being based on single specimens in two instances, and in the others on series of three to six specimens, not all of them adult.

The variation in the tuft or remnant of the crest follows a trend and is of interest. A short crest or a remnant of it is present in more specimens from the southern Malay Peninsula than in those from Sumatra. The former, not being so isolated as the latter, intergrade on the border of the range with crested birds from farther north in the peninsula. Here and there in Sumatra a few specimens will show a tuft or degenerated crest similar to that found in most of the southern Malay Peninsula birds. But the number of such specimens is much fewer and when the western Sumatran islands are reached, the tuft, if present at all, has de-

generated still further to the point where it becomes impossible to measure.

Dicrurus paradiseus formosus Cabanis

Dissemurus formosus CABANIS, 1850, Museum Heineanum, vol. 1, p. 111. Barta, Java.

Dissemurus paradiseus wallacei HACHISUKA, 1926, Bull. Brit. Ornith. Club, vol. 47, p. 58. Modjokerto, eastern Java. (Type in British Mus.)

Bill a little shorter than in *platurus*, but all other measurements similar, except that of the racket which is very much longer, its size averaging very close to that of the largest race (*grandis*) of the species. Differs from *platurus* also in having a rather short but well-developed crest which curves backward onto the crown (fig. 14, no. 5). The combination of small general size and long racket distinguishes *formosus* well from the other races of *paradiseus*.

SPECIMENS EXAMINED: Western Java: Buitenzorg, 2 ad. ♂, 1 ad. ♀; Palaboehanratoe, 5 ad. ♂, 2 ad. ♀; Boeroekaret, 1 ad. ♂, 1 ad. ♀; no locality, 2 ad. ♂. Eastern Java: Mt. Ardjoeno, 1 subad. ♂; Pasoeroean, 1 unsexed ad. Goenoeng Slasie (not located), 2 subad. ♂. Java, no locality, 2 ad. ♂, 1 unsexed ad.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 18.0–22.0 (19.78); female, 18.0–20.8 (19.10); whole culmen, male, 30.0–33.0 (31.78); female, 30.0–33.0 (31.0). Wing, male, 142.0–152.0 (147.92); female, 143.0–150.0 (146.0). C.T.F., male, 123.0–134.0 (128.22); female, 123.0–135.0 (128.50). O.T.F., male, 297.0–389.0 (343.0); female, 303.0–335.0 (320.0). Length of racket, male, 90.0–108.0 (97.0); female, 81.0–99.0 (91.25). Width of racket, male, 17.0–26.0 (21.0); female, 19.0, 21.0 (20.0). Crest, male, 10.0–20.0 (15.41); female, 9.0–17.0 (12.0).

RANGE: Java.

DISCUSSION: Shortly after its publication, *D. p. wallacei* Hachisuka was withdrawn by its author as equaling *formosus* (p. 75 of the same publication in which it was described).

I wish to express to Dr. G. C. A. Junge my gratitude for the cordial way in which he came to my assistance. As the material available to me from Java consisted of but four specimens, only one of which was adult, Dr. Junge was very kind to measure for me

a series of adult specimens in the Leiden Museum. These are the measurements given above.

The interest of *formosus* lies in the fact that the crest reappears in Java after having gradually disappeared and completely degenerated in the intervening territory in the southern Malay Peninsula and Sumatra. Also of interest is the great length of the racket. In 10 adult males from the Leiden Museum it ranges from 90 to 108 mm., averaging 97.0; another male has a racket of only 76, and in my lone specimen it measures 126! Including these two extreme measurements, the average is still 96.16, a size equal to that of the largest races in Burma and northern India.

Dicrurus paradiseus hypoballus Oberholser

Edolius malayensis BLYTH, 1859, Jour. Asiatic Soc. Bengal, vol. 28, p. 272. Penang and the Andamans. Restricted to the Malay Peninsula north of latitude 4° N., type locality Penang, by Kloss, 1918, Ibis, p. 519.

Dissemurus paradiseus hypoballus OBERHOLSER, 1926, Jour. Washington Acad. Sci., vol. 16, no. 19, p. 518. "Prahmon, Trang, Lower (Peninsular) Siam." (Type in U.S.N.M.)

Similar to *platurus* in all respects except that all the specimens now have a short but well-developed crest (fig. 14, no. 6), similar in size to that of *formosus*. The racket in *hypoballus* averages a little longer and broader than in *platurus*.

SPECIMENS EXAMINED: Peninsular Siam: Ban Don, 1 subad. ♀; Tha Lo, near Ban Don, 1 ad. ♂, 1 ad. ♀, 2 subad. ♀; Sichon, 1 ad. ♂, 1 subad. ♂, 1 ad. ♀; Ko Samui, 1 ad. ♂; Ko Phangan, 1 ad. ♂, 1 subad. ♀, 1 imm. ♀; Khao Luang, west of Nakhon Si Thammarat, 1 subad. ♂, 1 ad. ♀; Prahmon, Trang, 1 ad. ♂ (the type of *D. p. hypoballus*), 2 ad. ♂, 2 subad. ♂, 1 ad. ♀, 1 subad. ♀ (the paratypes of *D. p. hypoballus*); Khao Soi Dao, southeast of Trang, 1 ad. ♂, 2 subad. ♂; Pulo Adang, 1 ad. ♀; Pulo Langkawi, 1 subad. ♀; Bangnara (Narathiwat), 1 ad. ♂, 2 subad. ♂, 1 subad. ♀; Bukit, 1 imm. ♀. Penang, 1 ad. ♂, 1 ad. ♀.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 19.0–25.0 (22.0); female, 20.5–22.0 (21.20); whole culmen, male, 30.0–37.0 (33.45); female, 30.5–33.0 (32.10). Wing, male, 144.0–152.0

(147.56); female, 141.0–152.0 (145.60). C.T.F., male, 115.0–139.0 (124.13); female, 117.0–129.0 (121.20). O.T.F., male, 304.0–367.0 (333.0); female, 281.0–298.0 (290.0). Length of racket, male, 67.0–80.0 (74.50); female, 72.0–80.0 (77.20). Width of racket, male, 16.5–26.5 (21.0); female, 17.0–22.0 (19.66). Crest, male, 12.0–22.0 (15.56); female, 9.0–14.0 (12.0).

RANGE: Malay Peninsula and coastal islands from lower Tenasserim at about the level of latitude 11° N. to about latitude 4° N. in Lower Perak, south of which it is replaced by *platurus*, the two forms intergrading into one another. North of latitude 11° N. *hypoballus* is replaced by *paradiseus*, the two forms intergrading into each other.

DISCUSSION: Two very different drongos have received the name *malayensis*, and in both cases Blyth was the author. The first time (1846) that he used this name he gave it to a race of the Bronze Drongo (*aeneus*); the second time (1859) he gave it to the race of *paradiseus* found in the Malay Peninsula from lower Tenasserim to Perak. In both cases Blyth's descriptions are adequate and perfectly clear, but the second description was overlooked by Oberholser, and as a result he unnecessarily renamed as *hypoballus* the Malay Peninsula race of *paradiseus*.

While the two different drongos were considered to belong to two separate genera, both *malayensis* could be used. But, as I have explained in the general discussion of the genera, this generic distinction cannot be maintained and *Edolius malayensis* Blyth, 1859, now becomes preoccupied by *Chaptia malayensis* Blyth, 1846, and since the next available name must replace it, *hypoballus* Oberholser, 1926, becomes valid after all.

Dicrurus paradiseus paradiseus Linnaeus

Cuculus paradiseus LINNAEUS, 1766. Systema naturae, ed. 12, vol. 1, p. 172. Siam. Based on "le Coucou verd [*sic*], hupé de Siam," Brisson, 1760, Ornithologia, vol. 4, p. 151, fig. 1, pl. 14. Restricted "to the region between Ayuthia and the head of the Gulf" of Siam, by Kloss, 1919, Jour. Nat. Hist. Soc. Siam, vol. 3, p. 453.

Lanius malabaricus LATHAM, 1790, Index ornithologicus, vol. 1, p. 66. Malabar. Based on "le Grand Gobe-mouches de la côte de Malabar," Sonnerat, 1782, Voyage aux Indes orientales, vol. 2, p. 195, pl. 111.

Edolius retifer TEMMINCK, 1823, Nouveau recueil de planches coloriées d'oiseaux, vol. 3, livr. 30, text to pl. 178. Malabar, Java, and Sumatra.

Edolius setifer TEMMINCK, 1839, *op. cit.*, vol. 1, livr. 102. Tableau méthodique, p. 20. *Nomen emend.*

Edolius cristatellus BLYTH, 1842, Jour. Asiatic Soc. Bengal, vol. 11, p. 171. Tenasserim coast.

Dissemurus paradiseus mallomicrus OBERHOLSER, 1926, Jour. Washington Acad. Sci., vol. 16, no. 19, p. 518. Hastings Island, Mergui Archipelago. (Type in U.S.N.M.)

Similar to *hypoballus* but larger in every measurement and more ornate. A little glossier, the spangles on the breast larger and more sharply defined; the pointed feathers at the sides and hind part of the neck are more elongated and form a well-developed cape. The crest is much better developed and averages almost twice as long, its feathers are wider, and the longest ones reach to the posterior part of the crown (fig. 14, no. 7).

SPECIMENS EXAMINED: A. Southern India: Travancore: Mynall, 1 ad. ♂; Nelliampathi, 1 ad. ♂; no locality, 1 ad. ♂, 1 ad. ♀. "Malabar," 1 subad. ♂, 1 unsexed subad. Nuggur (not located), 1 ad. ♂ [?]. Southwestern Madras Presidency: Calicut, 1 unsexed ad.; Nilgiri Hills, Coonoor, 1 ad. ♀; Nilambur (not located), 1 ad. ♂. Mysore: Havaligurda (not located), 1 ad. ♂ [?]; Antarasante, 1 ad. ♂. Southern Bombay Presidency: Siddapur, 1 unsexed subad.; Vengurla, 1 unsexed ad.; Supa (near Londa), 1 imm. ♀; Jagalbed (near Londa), 1 ad. ♂; Londa, 4 ad. ♂, 1 subad. ♂, 2 ad. ♀, 2 subad. ♀, 2 imm. ♀.

B. Northern Tenasserim: Yoonzalern River, Sinzaway Forest (not located), 1 ad. ♂; Nabumah (near Moulmein), 1 ad. ♂; Kawkareik, 1 subad. ♀; Haung tharaw River Valley, Kaukarit, 2 ad. ♂, 1 imm. ♂; Kempenpit, 1 ad. ♂; Kaukarit Mts., Um Pang (Siam-Tenasserim border), 1 ad. ♀, 1 subad. ♀, 1 imm. ♀; foot of Taok Plateau, 1 ad. ♀; "30 miles East of Tavoy," 1 ad. ♂, 1 subad. ♀.

C. Western Siam: Me Ping River, 1 ad. ♂; Ban Samong, 1 ad. ♂; Ban Rahaeng, 2 ad. ♂; Mae Tha Kwae (near Ban Rahaeng), 1 ad. ♀, 1 subad. ♀.

D. Mergui Archipelago: Hastings Island, 1 ad. ♂ (the type of *D. p. mallomicrus*); Bentinck Island, 1 ad. ♀; Loughborough Island, 1 ad. ♂; Chance Island, 1 ad. ♂, 3 ad. ♀ (the paratypes of *D. p. mallomicrus*).

E. South central and central Siam: Koh Lak, 1 ad. ♀; Pran Buri, 2 ad. ♂, 1 subad. ♂, 1 sub-

ad. ♀, 1 unsexed ad.; Petchaburi, 1 ad. ♂; Rajaburi, 2 ad. ♂; Kanchanaburi, 4 ad. ♂, 2 imm. ♀; Bo Ploy (near Kanchanaburi), 2 imm. ♀; Sakeo ("near Krabin"), 1 subad. ♀; Bung Borapet, 1 ad. ♀; Bangkok, 2 ad. ♂, 1 subad. ♂, 1 imm. ♂, 2 subad. ♀; Nondha Buri, 1 unsexed imm.; Ban Bua Jum, 1 ad. ♂, 1 imm. ♂; Ban Tawai Phra, 1 subad. ♀; Kao Pae Pan Nam (west of Lomkao), 1 ad. ♀; Pakchong, 3 ad. ♂, 1 subad. ♂, 1 imm. ♂; Lat Bua Kao, 2 ad. ♂, 1 imm. ♂, 1 imm. ♀; Hin Lap (near Khorat), 1 imm. ♂, 1 imm. ♀.

F. Southeastern Siam: Nong Khor, 2 ad. ♂, 1 subad. ♂, 1 imm. ♂, 3 ad. ♀; Klong Yai, 1 imm. ♂, 1 ad. ♀; Ban Sadet, 1 ad. ♂, 1 nestling ♂, 1 imm. ♀; Huey Yang, 1 subad. ♂; Nong Yang, 1 ad. ♂, 2 imm. ♀—(all these localities near Ban Si Racha)—Chanthaburi, 1 ad. ♀; Kao Sabab (near Chanthaburi), 3 ad. ♂, 1 subad. ♂; Khao Saming (near Ban Bang Phra), 1 ad. ♂, 1 imm. ♀; Kao Bantad (east of Ban Bang Phra), 1 ad. ♂; Klong Menao (not located), 1 imm. ♀.

G. Southern Indochina: Aranya (Siam, near Cambodian border), 2 imm. ♀. Cambodia: Phum Lion, 1 unsexed imm.; Angkor Thom, 2 imm. ♀; Banteai Brei Forest, 1 unsexed imm. Cochinchina, Trang Born (near Bien Hoa), 2 subad. ♂, 1 unsexed imm. Southern Annam: Da Ban, 1 subad. ♂; Langbian Plateau, southeast end, 1 ad. ♂, 1 imm. ♂, 1 ad. ♀; Kronpha Plain, 1 ad. ♂.

MEASUREMENTS: The following measurements are those of all the adult specimens with the exception of those in paragraph C.

Length of bill, from anterior border of nostril, male, 21.0–24.0 (23.20); female, 20.0–25.0 (22.81); whole culmen, male, 30.0–38.0 (34.77); female, 32.0–36.0 (34.25). Wing, male, 154.0–167.5 (159.38); female, 149.0–160.0 (154.0). C.T.F., male, 127.0–149.0 (137.69); female, 128.0–145.0 (135.21). O.T.F., male, 351.0–453.0 (393.11); female, 334.0–403.0 (357.42). Length of racket, male, 76.0–111.0 (88.73); female, 78.0–105.0 (90.50). Width of racket, male, 20.0–27.0 (22.87); female, 21.0–24.0 (22.50). Crest, male, 15.0–32.0 (24.16); female, 14.0–31.0 (22.29).

RANGE: India (south of the Godavari), Tenasserim, and the Mergui Archipelago, southwestern, central, and southeastern Siam, Cambodia, Cochinchina, Pulo Condore (Robinson and Kloss), southern Laos, and southern Annam. Along the northern borders of this range, in peninsular India, northern Tenasserim, western Siam, central Laos, and north central Annam, it intergrades with and is replaced by a larger race (*rangoonensis*); in

peninsular Siam, at about the level of latitude 11° N. it intergrades with and is replaced by a smaller race (*hypoballus*).

DISCUSSION: In the introduction to the species it was mentioned that the birds of southern India (*malabaricus*) are not separable from those of Tenasserim and of central and southern Siam (*paradiseus*), a conclusion already reached by Hume (1878) after his examination of very large series. As Hume's findings have been ignored or overlooked by all subsequent authors the question will be reexamined.

The following list gives the individual measurements from these two parts of the range and includes also those from the Mergui Archipelago. The measurements are those of only strictly adult males.

Wing. India: 153, 154, 154, 154, 155, 155, 155, 156, 156, 158, 161, 161, 162 (156.46); Siam: 154, 155, 155, 156, 157, 157, 158, 158, 159, 159, 159, 160, 160, 160, 160, 160, 161, 162, 162, 162, 163, 163, 163, 164, 164, 165, 166, 167.5 (160.26); Tenasserim: 160, 163, 163, 165, 166, 166 (163.83); Mergui: 154, 158 (156.0).

O.T.F. India: 358, 391, 392, 403, 406, 422, 429, 436, 449, 453 (413.90); Siam: 351, 353, 359, 359, 365, 365, 367, 370, 372, 373, 376, 378, 382, 386, 387, 387, 393, 395, 396, 404, 416, 418, 428, 429 (383.71); Tenasserim: 349, 358, 393, 396, 428, 431 (392.50); Mergui: 381, 423 (402.0).

Racket. India: 83, 87, 89, 94, 94, 96, 96, 97, 100, 105, 111 (95.63); Siam: 76, 80, 80, 82, 82, 83, 83, 84, 84, 84, 85, 86, 86, 86, 87, 87, 88, 90, 90, 92, 92, 92, 92, 93, 94, 97, 98, 99, 99, 100 (88.37); Tenasserim: 77, 80, 87, 93, 95, 95 (87.84); Mergui: 86, 97, 101 (94.66).

Crest. India: 16, 17, 18, 18, 19, 21, 21, 25, 25, 26, 28, 30 (22.0); Siam: 15, 17, 17, 17, 19, 20, 20, 21, 22, 22, 22, 22, 22, 25, 26, 27, 27, 27, 27, 28, 28, 28, 28, 29, 30, 31, 32, 32, 32 (24.67); Tenasserim: 25, 28, 28, 30, 31, 35 (29.40); Mergui: 17, 22, 24, (21.0).

It can be seen that the overlap in individual measurements is complete or virtually so.

In an effort to see whether the birds of southern India could be separated from those of central and southern Siam by other than a comparison of individual measurements, ratios were plotted as between the O.T.F. and C.T.F., wing and bill, and racket and crest.

But by none of these could the two populations be separated.

There is, however, a difference in the means of the length of the O.T.F. which deserves notice. According to Simpson and Roe (1939), this difference, amounting to 30 mm., shows a deviation from the standard error between the two means of 3.319, a figure almost always significant. However, the sample, consisting of 34 specimens, is close to the limit of 30, below which it is said this method is unreliable.

Despite the fact that this difference may be statistically significant, I feel that the two populations cannot be separated, since it cannot be done by the plotted ratios and especially since the overlap in individual measurements amounts to 70 per cent in the case of the O.T.F. and is much higher in the case of the racket.

The tendency towards a longer tail and racket, however, does seem to exist in the Indian birds, and the question arises whether a larger sample might not emphasize the difference. It will be recalled, in this connection, that Baker's measurements (1918, p. 300) of a much larger series show an even greater similarity. Twenty-eight specimens from central and southern India average for the wing, 152 mm., and 59 specimens from Siam and the northern Malay Peninsula, 151. The same specimens have a tail which measures up to 415 in India and 420 in Siam. The bill measurements are also similar, 26-29 in India and 27-30 in Siam.

In the same paper Baker also mentions that "The birds in the west of the Malay Peninsula . . . from Tavoy and Mergui, are larger than those on the east, and may possibly eventually have to be linked with *rangoonensis*." This difference in size is borne out by my measurements. However, the measurements of these specimens (paragraph B of the list of specimens examined) fall within the range of variation of *paradiseus* from central and southern Siam and not within that of *rangoonensis*.

The birds in paragraph C from the vicinity of Ban Rahaeng in western Siam are also larger than *paradiseus* from farther south and east. Although the measurements of these few specimens are not included in the over-all measurements given for *paradiseus*, they are

very much closer to this form than they are to *rangoonensis*.

The birds in that region and westward, together with those of northern Tenasserim, appear to be intermediate and to represent areas where the two forms intergrade into each other.

The specimens in paragraph G, from Cambodia, Cochinchina, and southern Annam, tend to have smaller crests but are very much closer in this respect to *paradiseus* than they are to *hypoballus*. Their other measurements fit exactly into the range of variation of *paradiseus* and nowhere approach the smaller measurements of *hypoballus*.

Oberholser separated the birds from the Mergui Archipelago as *mallomicrus* on the basis of specimens being smaller than *rangoonensis* from Burma. This is perfectly true, they are smaller; however, had the comparison been made with *paradiseus* from the mainland and from central and southern Siam, it would have been apparent that there is no difference.

Robinson and Kloss (1921), reporting on a collection from Pulo Condore, gave the wing measurements of a series of adults as, male, 154, 157, 159, 166 (159.0); female, 153, 155, 159, 161, 161, 165 (159.0). They identified these specimens as *D. p. malayensis* (= *hypoballus*), stating, "The wing lengths of these birds are about the same as in *D. p. paradiseus* of Central Siam, but the crests are much smaller and much less laterally compressed and curved, though more bushy. Pulo Condore birds and birds of Cochinchina are not to be distinguished from *D. p. malayensis* . . ."

Again (1930), the same authors reported on additional material from Pulo Condore, the new series consisting of eight adult males, three adult females, and two immature females. This time the individual wing measurements are not given, and the authors are less certain about identifying this additional material as *malayensis* (= *hypoballus*). They state, "Best referred to this race rather than to true *D. p. paradiseus* from Siam, or to *D. p. platyrus* Vieill., from the extreme south of the Malay Peninsula and Sumatra. In size, with the wing up to 171 mm., they are rather large for *malayensis*, but the crest is too small for *D. p. paradiseus*."

When the individual wing measurements of

the birds of Pulo Condore as supplied by Robinson and Kloss (1921) are used, the comparative measurements are:

Pulo Condore, four males, 154.0–166.0 (159.0); six females, 153.0–165.0 (159.0).

Central, southwestern, and southeastern Siam: 28 adult males, 154.0–167.5 (160.26); 12 adult females, 151.0–163.5 (157.38).

Malay Peninsula, between latitudes 5° and 10° N. (*hypoballus*): 10 adult males, 144.0–152.0 (147.56); six adult females, 141.0–152.0 (145.60).

I cannot judge as to the crest as I have not examined any specimens from Pulo Condore, and cannot compare its measurements as nowhere do Robinson and Kloss indicate its length. But, judging by the wing length which is less variable than that of the crest, and provided the structure of the crest is not peculiar to the birds of Pulo Condore, I believe that they should be referred to *D. p. paradiseus* rather than to *D. p. hypoballus*. It can be seen above that the measurements of the birds of Pulo Condore match exactly those of Siam, but do not fit at any point within the range of variation of *hypoballus*.

Dicrurus paradiseus rangoonensis Gould

Edolius rangoonensis GOULD, 1836, Proc. Zool. Soc. London, p. 5. Rangoon.

Similar to *paradiseus* but larger in every measurement. Breast spangles more prominent, cape more developed. The crest is very large and full and reaches to well beyond the crown (fig. 14, no. 8). In every character and measurement, *rangoonensis* is perfectly intermediate between the more southern *paradiseus* and the more northern *grandis*.

SPECIMENS EXAMINED: A. Central India: Northern Bombay Presidency, Kheri, 1 subad. ♀. Central Provinces, Raipur, 1 subad. ♂. Orissa, Sambalpur, 1 subad. ♂, 1 imm. ♀. Eastern States, Surguja: Khuri, 2 ad. ♂, 1 ad. ♀; Ramanujganj, 1 subad. ♂; Gargori, 1 ad. ♂.

B. Northern Siam: Doi Hua Mot, 1 imm. ♂; Doi Khun Tan, 1 subad. ♀, 1 imm. ♀; Doi Ta Kong, 1 imm. ♂; Doi San Pa Bong, 1 ad. ♂; Doi Pu Het, 1 ad. ♂; Doi Khrang, 1 ad. ♀, 1 imm. ♀; Ban Na Noi, 1 ad. ♂, 1 ad. ♀; Wieng Papao, 1 imm. ♂, 1 imm. ♀; Muang Pai, 1 ad. ♂; Chom-tong, 1 ad. ♂; Sobpung, 1 ad. ♂; Ban Ta Pai, 1 imm. ♂; Ban Huai Pa Pai, 1 imm. ♂; Ta Fang, 1 ad. ♀.

C. Northeastern Siam, on the Mekong River:

Ban Den Muang, 1 subad. ♂; Nakhon Phanom, 1 ad. ♂.

MEASUREMENTS: The following measurements are those of all the adult specimens.

Length of bill, from anterior border of nostril, male, 24.0–27.0 (25.44); female, 23.0–26.0 (24.84); whole culmen, male, 33.0–41.0 (37.0); female, 33.5–38.0 (35.50). Wing, male, 163.0–172.5 (167.71); female, 164.0–170.0 (166.0). C.T.F., male, 138.0–156.0 (146.25); female, 135.0–147.0 (141.0). O.T.F., male, 376.0–427.0 (400.0); female, 348.0–393.0 (375.0). Length of racket, male, 86.0–108.0 (95.0); female, 81.0–102.0 (90.50). Width of racket, male, 24.0–26.0 (24.80); female, 22.0–26.0 (23.67). Crest, male, 31.0–55.0 (42.50); female, 32.0–48.0 (37.0).

RANGE: Central India, central and southern Burma, southern Chin Hills (Baker), Southern Shan States (Baker), northern and northeastern Siam, central Laos, and central Annam. Intergrades into *grandis* and *paradiseus* on the respective borders of its range.

DISCUSSION: Delacour (1931) gives the range of *D. p. paradiseus* as extending through southern Laos and central Annam, and that of *D. p. grandis* just to the north, specimens of the former being reported as far north as Vientiane and Napé. I have only one adult from that region, a male from Nakhon Phanom, and its measurements are much too large for *D. p. paradiseus* but, though slightly larger than the average of the measurements of *D. p. rangoonensis* from northern Siam, fall within its range of variation.

In my series the individual wing length of all my more northern specimens of *D. paradiseus* measure as follows, all the specimens being fully adult males:

Northern Burma, Assam, and Cachar: 175, 176, 183.5, 184, 184, 185 (181.25).

Nepal and vicinity: Sevoke, northern Bengal, 173; Nichloul, northern United Provinces, 175; Simra, Nepal, 177; average of the three, (175.0).

Border of Annam and Tonkin (Hoi Xuan): 170, 170.

Lower Burma (Pegu): 163.

Northern Siam: 163, 165, 169, 170, 171.5, 172.5 (168.50).

Northeastern Siam (Nakhon Phanom): 172.

Central India (Surguja): 165, 168, 175 (169.33).

The number of specimens is insufficient; larger series might show that there is no significant size difference between the population of Nepal (type locality of *grandis*) and those of central India, lower Burma (type locality of *rangoonensis*), central Burma, northern and northeastern Siam, and northern Annam and Tonkin. If such should be the case, all the birds from these regions should be called *grandis*; the names *grandis* and *rangoonensis* were proposed simultaneously by Gould, and in view of the expanded range, *grandis* is the better choice.

On the other hand, the northernmost populations average distinctly larger. Of six specimens from northern Burma, Assam, and Cachar, the wing in four specimens measures 183.5 to 185.0 (184.12), a measurement not even approached by any specimen of the more southern populations. If this difference is supported by additional measurements, the populations of northern Burma, Assam, and Cachar are the largest of the species and stand at the other extreme of the cline which started on Borneo.

Dr. S. Dillon Ripley has kindly supplied me with the measurements of three specimens that he collected recently in the Mishmi Hills in extreme northeastern Assam. One of the three specimens is an adult male whose wing measures 184.5 and its crest, 70.0, which is a longer crest than that of any male that I have measured. This specimen was collected at 650 feet at Tezu.

Until further study, the names *rangoonensis* and *grandis* can both be retained. Under the former I have placed the birds found in the regions listed above under the range of *rangoonensis*, and under *grandis* those found to the north of these regions from Kashmir to Tonkin.

Dicrurus paradiseus grandis Gould

Edolius grandis GOULD, 1836, April 9, Proc. Zool. Soc. London, p. 5. Nepal.

Chibia malabaroides HODGSON, 1836, November 15, India Rev., vol. 1, p. 325. Nepal.

Edolius bengalensis BLYTH, 1846, Jour. Asiatic Soc. Bengal, vol. 15, p. 296. Assam, Arracan, and Bengal.

Dissemurus alcocki FINN, 1899, Jour. Asiatic

Soc. Bengal, vol. 68, p. 119, pl. 2. Gorakhpur District? [partially albinotic aviary specimen.]

Similar to *rangoonensis* but still larger in every measurement. The pointed feathers at the sides and hind part of the neck are still longer and form a prominent cape. The crest is magnificent; its front feathers are longer, more attenuated and erect than in the more southern races, while its main feathers are broader and, being longer, reach to the nape or beyond it (fig. 14, no. 9).

SPECIMENS EXAMINED: A. Northern India: Kashmir, no locality, 1 unsexed imm. Kumaon, no locality, 1 unsexed ad. Northern United Provinces, Nichlaur, 1 ad. ♂, 1 subad. ♂, 1 ad. ♀, 1 subad. ♀. Nepal, Simra, 1 ad. ♂. Sikkim, no locality, 1 unsexed ad. Northern Bengal: Darjeeling district, Rohatang, 1 ad. ♀; Sevoke, 1 ad. ♂; Siliguri, 1 ad. ♀.

B. Northern Cachar, Assam, and northern Burma: Northern Cachar: Gunjong, 1 ad. ♂, 1 ad. ♀; Maher, 1 ad. ♂, 2 ad. ♀, 1 subad. ♀. Assam: Tura, 1 ad. ♂, 1 imm. ♂; Margherita, 1 ad. ♂, 1 ad. ♀; Dibrugarh, 1 ad. ♂. Northern Burma: upper Chindwin: Lonkin, 1 ad. ♀; Tawmaw, 1 subad. ♀; Gora, 1 ad. ♀; Mingin, 1 ad. ♀; Leybin, 1 subad. ♂. Myitkyina, 1 ad. ♂.

C. Extreme northern Annam: Hoi Xuan, 2 ad. ♂, 1 ad. ♀. Tonkin: Bac Kan, 1 subad. ♂.

MEASUREMENTS: The following measurements are those of the adults listed in paragraph B only. The specimens from the regions represented by paragraphs A and C are smaller and were discussed under *rangoonensis*.

Length of bill, from anterior border of nostril, male, 25.0–29.0 (27.43); female, 25.0–28.0 (27.0); whole culmen, male, 39.0–43.5 (41.21); female, 38.0–42.0 (40.10). Wing, male, 175.0–185.0 (181.25); female, 165.0–181.0 (170.35). C.T.F., male, 145.0–162.0 (157.33); female, 142.0–155.0 (149.10). O.T.F., male, 447.0–578.0 (498.0); female, 362.0–458.0 (396.45). Length of racket, male, 96.0–112.0 (103.40); female, 80.0–101.0 (92.67). Width of racket, male, 22.0–30.0 (24.83); female, 23.0–28.0 (25.0). Crest, male, 54.0–66.0 (58.33); female, 46.0–70.0 (53.40).

RANGE: Northern India, along the foothills and lower slopes of the Himalayas (up to 4000 feet), from Kashmir to the Mishmi Hills of extreme northeastern Assam (Ripley), northern Cachar, northern Burma, as far south as the northern Chin Hills and North-

ern Shan States, Yunnan, Tonkin, northern Laos, and northern Annam. Intergrades into *rangoonensis* along the southern borders of the range.

Dicrurus paradiseus johnei Hartert

Dissemurus paradiseus johnei HARTERT, 1902, Novitates Zool., vol. 9, p. 579. Five Finger Mountains, Hainan. (Type in A.M.N.H.)

Differs from both *rangoonensis* and *grandis* by the shape of the crest and the structure of its feathers; the crest of *johnei* curves more upward, is fuller and softer, lacks the attenuated and hairy frontal plumes, and its main feathers are broader and less pointed (fig. 14, no. 10). In length, the crest is longer than that of *rangoonensis* and a little shorter than that of *grandis*. The shoulder cape is less prominent, its feathers being broader, less pointed, and generally shorter than in either *rangoonensis* and *grandis*. With the exception of the crest, the other measurements of *johnei* are similar to those of *rangoonensis*.

SPECIMENS EXAMINED: Hainan Island: Five Finger Mts., 1 ad. ♂ (the type of *D. p. johnei*); No Tai, 1 ad. ♂; Nodoo, 1 ad. ♂ [?]; Mt. Wuchi, 3 ad. ♀; Cheteriang, 6 ad. ♂, 2 subad. ♂, 3 ad. ♀; no locality, 1 ad. ♂ [?].

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 23.0–27.0 (25.20); female, 24.0–26.0 (24.84); whole culmen, male, 34.0–39.0 (37.0); female, 31.0–37.0 (34.50). Wing, male, 162.0–180.0 (168.10); female, 157.0–163.0 (160). C.T.F., male, 136.0–158.0 (144.45); female, 135.0–142.0 (138.50). O.T.F., male, 364.0–454.0 (414.80); female, 332.0–402.0 (365.0). Length of racket, male, 80.0–98.0 (88.70); female, 84.0–92.0 (87.60). Width of racket, male, 23.0–25.0 (23.50); female, 22.0, 25.0 (23.50). Crest, male, 47.0–57.0 (52.40); female, 40.0–51.0 (45.40).

RANGE: Hainan Island.

Dicrurus paradiseus ceylonicus, new name

Dissemurus ceylonensis SHARPE, 1877, Catalogue of the birds in the British Museum, vol. 3, p. 264, figs. 10–11. Northeastern Province, Ceylon.

Similar to *paradiseus* but smaller, especially the tail. Crest well developed but shorter, the feathers reaching only to the top of the

crown. Breast spangles less well defined, and the pointed feathers of the cape shorter and less well developed.

The O.T.F. differs from all the other races of *paradiseus* that have a racket tail. In the immature plumage of *ceylonicus* this feather is prolonged but is almost fully webbed, only a hollow or emargination, variable in extent, appearing opposite the tips of the penultimate pair. In the subadult plumage the shaft is denuded but not completely so, a narrow fringe of barbs persisting on both sides; the shaft itself is straight and does not spiral. In the adult plumage the shaft does spiral and is completely denuded but along a distance which is proportionately shorter than in any of the other races of *paradiseus*. This is also true of the total length of the feather; for instance, in the smallest race of the species (*brachyphorus*), the wing-tail index is 212, in *hypoballus*, in which the length of the wing is very close to that of *ceylonicus*, the wing-tail index is 226, while in *ceylonicus* it is only 176.

SPECIMENS EXAMINED: Ceylon: northeastern Ceylon, Minere Lake, 2 ad. ♂; no locality, 1 imm. ♀. Southeastern Ceylon, Embilipitiya, 1 ad. ♂, 1 ad. ♀. Ceylon, no locality, 2 ad. ♂, 1 unsexed subad.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 22.0–23.5 (23.0); female, 21.0; whole culmen, male, 32.5–37.0 (35.5); female, 32.0. Wing, male, 150.0–156.0 (152.25); female, 151.0. C.T.F., male, 130.0–138.0 (132.75); female, 135.0. O.T.F., male, 235.0–295.0 (268.0); female, 220.0. Length of racket, male, 74.0–89.0 (79.25); female, 78.0. Width of racket, male, 18.0–21.5 (19.50). Crest, male, 17.0–29.0 (22.0); female, 22.0.

RANGE: Ceylon in the Low-country Dry Zone in the north, east, and south of the island, and in the drier parts of the Hill Zone "up to about 2000 feet" (Whistler).

DISCUSSION: As in the case of *D. p. malayensis* (now *hypoballus*), my reducing *Dissemurus* to a synonym of *Dicrurus* necessitates the renaming of *Dissemurus ceylonensis* Sharpe, 1877, as this name now becomes preoccupied by *Dicrurus ceylonensis* Stephens, 1826. The latter name never became the name of a separate form, since the

form to which it was applied had already been named *D. leucophaeus* by Vieillot in 1817. No confusion therefore needs to arise, and the original meaning can be preserved by substituting *ceylonicus* as a new name for the bird formerly well known as *ceylonensis* Sharpe.

Two races of *paradiseus* are found on Ceylon: one, the present form (*ceylonicus*), occupies the Low-country Dry Zone in the north, east, and south of the island; the other (*lophorinus*) occupies the Low-country Wet Zone in the southeast and is also found in the wetter parts of the Hill Zone. These two forms are identical in plumage, both are crested, but the adult *ceylonicus* has a racket tail, whereas in *lophorinus* the tail is fully webbed. That *ceylonicus* was a form of *paradiseus* was evident, but the fact that *lophorinus* had no racket tail has caused much confusion, and owing to this sole difference, *lophorinus* was mercilessly dragged through many a long debate and placed as a result in no fewer than four genera.

Though not expressed as such, Legge (1879) was aware that the two forms were closely related, and he discussed and illustrated what he called an abnormal adult variety of *D. paradiseus* which differed only from *lophorinus* by having a tail which had a conspicuous hollow or emargination on the inner web of the O.T.F., and for which he proposed the name *intermedius*. Henry (1933) emphasized the fact that *lophorinus* and *ceylonicus* occupy separate and very different climatic zones in Ceylon. The whole question was finally settled by Whistler (1944) who, after studying the distribution of the two forms and examining the specimens of Legge, came to the conclusion that *lophorinus* should unquestionably be considered a race of *paradiseus*.

Whistler is supported by additional material collected and discussed by Ripley (1946), and in the collection of the American Museum there is a nearly adult specimen, though unfortunately without locality, in which both of the outer tail feathers are emarginated, this emargination being exactly similar to that shown by the immature of *ceylonicus* and the "abnormal" adult form of Legge. Through the courtesy of Dr. Ripley and the United States National Museum, I was able

to examine and include in my material the specimens discussed by Ripley, three of which, collected near Pelmadulla, are intermediate to a varying degree between *lophorinus* and *ceylonicus*. The evidence of these specimens in addition to those of Legge shows that on the respective borders of their range (in the north in the case of Legge's specimens, and in the south for those of Ripley), the two forms can breed with each other.

Ripley further considers *lophorinus* to be the earlier inhabitant of Ceylon, and *ceylonicus* to be a later arrival by a secondary invasion. I believe this view to be correct; *ceylonicus* shows by its present distribution that it undoubtedly arrived fairly recently by way of India, and *lophorinus*, as I have mentioned under *D. andamanensis*, presumably reached Ceylon directly from the Malay Peninsula by crossing the Bay of Bengal by way of the Andaman Islands. Evidently *lophorinus* failed to develop effective reproductive isolation, and the changing climatic conditions of Ceylon are tending to bring the two forms more and more into contact. For, as Ripley mentions, the cutting and burning of the jungle in some parts of Ceylon, with the resulting drying up of the peripheral areas of the rain forest during the dry season, are favoring encroachment and overlapping by the dry-zone birds of territory formerly claimed by wet-zone forms.

Whistler (1944) places the name *intermedius*, applied by Legge to his "abnormal" specimens, into the synonymy of *ceylonicus*. I have not examined Legge's type, but I have examined a specimen identical to the one figured and described by Legge, as well as others that were more or less intermediate between the two races, and I am quite satisfied that Legge's specimen was such a hybrid. As such it would seem that the name *intermedius* cannot be placed correctly in the synonymy of either of the two Ceylon forms.

Dicrurus paradiseus lophorinus Vieillot

Dicrurus lophorinus VIEILLOT, 1817, Nouveau dictionnaire d'histoire naturelle, nouvelle édition, vol. 9, p. 587. Based on "le Drongup," Levaillant, Oiseaux d'Afrique, 1805, vol. 4, p. 70, pl. 173. India, restricted to Ceylon.

Dicrurus edoliformis BLYTH, 1846, Jour. Asiatic Soc. Bengal, vol. 15, p. 297. Ceylon.

Differs from *ceylonicus*, as well as from all the other races of *paradiseus*, by lacking the racket tail in all stages of the plumage. The tail instead is long and deeply forked; the outer tail feathers are prolonged beyond the others but are completely webbed throughout their length and curve strongly upward at their tips.

With this striking exception the appearance of the plumage is identical to that of *ceylonicus*, but the crest is shorter, denser, and stiffer, the longest feathers curving backward over the forehead (fig. 14, no. 12). The general measurements, with the exception of those of the O.T.F., of course, are a little smaller than those of *ceylonicus* and almost identical with those of *hypoballus*.

SPECIMENS EXAMINED: Southwestern Ceylon: Rygamkorale, 1 ad. ♂, 1 ad. ♀, 1 subad. ♀ (?); Depedene Estate, near Rakwana, 2 ad. ♂, 1 ad. ♀; Pelmadulla district, Kaluwewa, 1 ad. ♂, 1 subad. ♂, 2 ad. ♀, 1 subad. ♀; Pelmadulla district, Naragode, 2 ad. ♂, 1 subad. ♂, 1 ad. ♀, 1 subad. ♀; Haputale, 1 ad. ♂, 1 ad. ♀; no locality, 1 ad. ♂ (?), 1 ad. ♀, 1 subad. ♀.

MEASUREMENTS: Individuals (Naragode, one adult male, and Kaluwewa, one subadult male, one adult female) showing intermediate characters between *lophorinus* and *ceylonicus* are not included in the following measurements.

Length of bill, from anterior border of nostril, male, 20.0–24.0 (22.08); female, 19.0–23.5 (21.58); whole culmen, male, 31.0–37.5 (34.0); female, 32.0–35.5 (33.93). Wing, male, 140.0–150.0 (145.72); female, 141.0–148.0 (144.72). C.T.F., male, 125.0–131.0 (128.14); female, 119.0–141.0 (126.36). O.T.F., male, 161.0–185.0 (171.0); female, 161.0–181.0 (171.71). Crest, male, 9.0–15.0 (12.50); female, 10.0–18.0 (14.50). Depth of fork, male, 32.0–54.0 (40.86); female, 32.0–56.0 (45.35).

RANGE: Ceylon in the forests of the Low-country Wet Zone "from the Deduru-oya on the north to the Welawe river in the south-east" (Whistler) and in the wetter parts of the Hill Zone, "to about 4500 feet" (Whistler).

DISCUSSION: Baker (1924) gives the distribution of *lophorinus* as "Ceylon and South Travancore"; again (1933, p. 339) it is stated on the authority of J. Stewart that in

Travancore "it has been found breeding freely in great numbers." However, Whistler (1944, p. 169) says of *lophorinus*, "Race peculiar to Ceylon." It would be curious if a man like Whistler, who was well acquainted with the birds of India, should overlook, when writing about the birds of Ceylon, a bird that bred in such "great numbers" in near-by Travancore. It is probable that J. Stewart, who from his account appeared to have collected only nests and eggs but says nothing about having collected birds, was mistaken in his identification. On Baker's own authority the eggs of drongos may be very much alike, for those of *lophorinus* cannot be distinguished from those of *D. p. paradiseus*.

***Dicrurus paradiseus otiosus* Richmond**

Dissemurus malabaricus otiosus RICHMOND, 1903, Proc. U. S. Natl. Mus., vol. 25, p. 290. Andamans. New name for *Edolius affinis* Beavan, 1867, Ibis, p. 323, not *Edolius affinis* Blyth, 1842.

A large race, virtually identical to *rangoonensis* in size and appearance with the exception of the crest which is lacking or rudimentary.

SPECIMENS EXAMINED: Andaman Archipelago: no locality, 1 unsexed subad. Henry Lawrence Island, 1 ad. ♂, 1 ad. ♀. South Andaman Island: Gopla ka bung, 2 ad. ♂; Mt. Harriet, 1 ad. ♂; Gibang, 1 subad. ♀. Little Andaman Island, Bumila Creek, 1 ad. ♂, 1 subad. ♂.

MEASUREMENTS: Length of bill, from anterior border of nostril, male, 24.0–26.0 (25.0); female, 24.0; whole culmen, male, 34.0–37.0 (35.40); female, 34.0. Wing, male, 162.0–169.0 (164.75); female, 157.0. C.T.F., male, 139.0–152.0 (145.60); female, 139.0. O.T.F., male, 359.0–474.0 (407.0); female, 330.0. Length of racket, male, 88.0–107.0 (98.25); female, 89.0. Width of racket, male, 21.0. Crest, male, missing in three out of five, other two, 14.0, 15.0; female, none.

RANGE: Andaman Islands.

***Dicrurus paradiseus nicobariensis* Baker**

Dissemurus paradiseus nicobariensis BAKER, 1918, Novitates Zool., vol. 25, p. 302. Kondel [Island], Nicobars.

Differs from *otiosus* of the Andamans by

being smaller and by having a crest. Similar to *paradiseus* and may be separable from it only by the size of the racket which appears to be smaller.

SPECIMENS EXAMINED: Nicobar Archipelago: Katchall Island, 1 ad. ♂. Little Nicobar Island, 1 ad. ♂, 1 subad. ♂, 2 ad. ♀. Great Nicobar Island, 2 ad. ♂.

MEASUREMENTS: Katchall: length of bill, from anterior border of nostril, male, 26.0; whole culmen, male, 34.0. Wing, male, 164.0. C.T.F., male, 137.0. O.T.F., male, broken. Crest, male, 28.0.

Little Nicobar: length of bill, from anterior border of nostril, male, 26.0; female, 22.0, 23.0 (22.50); whole culmen, male, 35.0; female, 35.0, 35.0. Wing, male, 165.0; female, 148.0, 156.0 (152.0). C.T.F., male, 138.0; female, 130.0, 135.0 (132.50). O.T.F., male, 382.0; female, 255.0, 330.0 (292.50). Length of racket, male, 81.0; female, 80.0. Width of racket, female, 21.0. Crest, male, 29.0; female, 22.0, 26.0 (24.0).

Great Nicobar: length of bill, from anterior border of nostril, male, 22.5, 25.0 (23.75); whole culmen, male, 35.0, 36.0. Wing, male, 155.0, 155.0. C.T.F., male, 127.0, 131.0 (129.0). O.T.F., male, 308.0, 310.0. Length of racket, male, 75.0, 77.0. Width of racket, male, 20.0. Crest, male, 22.0, 25.0 (23.50).

RANGE: Nicobar Islands.

DISCUSSION: The measurements of all the specimens are given individually, as there is considerable variation between Katchall and Little Nicobar Islands, on the one hand, and Great Nicobar, on the other, the birds from the latter being very definitely smaller. As the series is inadequate it is possible that a larger number of specimens from the various islands might close the gap. As it is, the measurements come very much closer to those of *paradiseus* than they do to those of *hypoballus*, except in the case of the two adults from Great Nicobar which have the tail and the racket of the same length as in *hypoballus*. The length of the crest in all the specimens is that of *paradiseus* and not that of *hypoballus*.

TABLE 12

COMPARATIVE PROPORTIONS IN PER CENT OF ADULT MALES AND FEMALES IN THE FAMILY DICRURIDAE
(*Dicrurus remifer* and *D. paradiseus* not included)

Form	Sex	Bill/Wing	O.T.F./Wing	O.T.F./C.T.F.
Genus <i>Chaetorhynchus</i>				
<i>papuensis</i>	♂	17.3-20.5 (19.18)	74.0- 87.0 (80.14)	90.0-100.0 (96.00)
	♀	18.5-21.6 (19.93)	75.0- 84.5 (79.64)	89.0- 99.0 (95.00)
Genus <i>Dicrurus</i>				
<i>ludwigii sharpei</i>	♂	18.5-20.1 (19.50)	81.5- 84.5 (83.30)	102.0-107.0 (105.00)
	♀	18.8-20.8 (19.82)	79.0- 89.5 (83.20)	105.0-108.0 (106.80)
<i>ludwigii ludwigii</i>	♂	18.9-20.6 (20.05)	80.5- 88.5 (84.75)	106.0-110.0 (107.88)
	♀	19.4-21.8 (20.93)	84.5- 87.5 (85.87)	106.0-109.5 (107.87)
<i>atripennis</i>	♂	18.4-22.5 (20.21)	82.0- 89.0 (84.60)	106.0-117.0 (110.42)
	♀	18.6-21.0 (20.83)	82.0- 93.5 (84.80)	101.0-115.0 (108.27)
<i>adsimilis adsimilis</i>	♂	16.1-19.8 (18.14)	81.5- 91.0 (86.59)	113.0-135.0 (124.00)
	♀	15.9-19.9 (18.15)	80.0- 91.5 (85.74)	112.0-132.5 (122.87)
<i>adsimilis divaricatus</i>	♂	16.9-19.6 (18.20)	79.0- 88.0 (84.10)	109.0-121.0 (113.61)
	♀	16.8-20.5 (18.56)	80.0- 88.5 (84.82)	106.0-122.0 (112.49)
<i>adsimilis coracinus</i>	♂	16.4-20.9 (19.22)	82.0- 93.0 (87.17)	116.0-130.0 (124.63)
	♀	16.9-20.9 (19.55)	82.5- 91.5 (87.02)	117.0-133.0 (124.31)
<i>adsimilis atactus</i>	♂	17.3-19.2 (18.16)	83.0- 88.0 (86.33)	118.0-131.0 (125.35)
	♀	17.8-20.0 (18.80)	84.0- 87.5 (85.50)	114.5-129.0 (119.50)
<i>adsimilis modestus</i>	♂	19.4-21.6 (20.47)	88.0- 96.0 (91.27)	115.0-122.0 (118.25)
	♀	20.2-21.6 (20.80)	88.0- 92.5 (90.34)	111.0-121.0 (114.60)
<i>fuscipennis</i>	♂	22.0-22.6 (22.32)	87.5- 88.5 (88.00)	113.0-115.0 (114.33)
<i>aldabranus</i>	♂	19.9-22.8 (21.66)	96.0-101.5 (98.90)	125.0-136.0 (129.78)
	♀	21.0-22.8 (22.20)	101.0-103.0 (102.00)	130.0-134.5 (131.50)
<i>forficatus forficatus</i>	♂	17.8-21.8 (19.64)	97.5-106.0 (100.65)	130.0-152.0 (141.50)
	♀	19.1-21.0 (20.30)	96.0-108.0 (100.40)	131.0-145.0 (137.67)
<i>forficatus potior</i>	♂	21.1-21.8 (21.40)	101.0-107.0 (103.60)	136.0-144.0 (139.80)
<i>waldenii</i>	♂	23.2 — —	140.0 — —	178.0 — —
<i>macrocerus albirictus</i>	♂	15.9-19.1 (17.22)	105.0-119.0 (111.20)	157.0-173.0 (162.21)
<i>macrocerus macrocerus</i>	♂	17.0-19.3 (18.20)	100.5-115.0 (108.25)	146.0-166.0 (156.17)
<i>macrocerus minor</i>	♂	19.9 — —	105.0 — —	152.0 — —
	♀	18.3 — —	102.0 — —	147.0 — —
<i>macrocerus cathoecus</i>	♂	16.8-19.5 (17.88)	95.0-105.0 (99.50)	130.0-144.0 (137.50)
	♀	16.6-19.8 (18.63)	95.0-101.5 (98.33)	130.0-140.0 (134.50)
<i>macrocerus thai</i>	♂	16.5 — —	124.0 — —	169.0 — —
<i>macrocerus harterti</i>	♂	17.2-19.3 (18.03)	94.0-103.0 (97.65)	126.0-142.0 (135.47)
	♀	17.8-18.8 (18.38)	94.0-103.0 (98.60)	128.0-139.0 (134.60)
<i>macrocerus javanus</i>	♂	17.0-18.8 (17.92)	117.0-120.0 (118.75)	164.0-171.0 (170.25)
	♀	18.2-18.8 (18.65)	114.0-121.0 (117.50)	153.0-162.0 (158.75)
<i>leucophaeus beavani</i>	♂	17.8-20.2 (19.00)	109.0-119.0 (113.30)	165.0-198.0 (178.70)
	♀	18.7-20.2 (19.60)	110.0-116.0 (113.20)	164.0-178.0 (169.00)
<i>leucophaeus longicaudatus</i>	♂	18.5-21.2 (19.46)	105.0-124.0 (113.00)	158.0-182.0 (170.45)
<i>leucophaeus hopwoodi</i>	♂	18.3-21.0 (19.60)	98.0-112.5 (106.65)	139.0-167.0 (153.00)
	♀	18.4-21.6 (19.74)	97.0-113.0 (105.56)	137.0-165.0 (150.00)
<i>leucophaeus mouhoti</i>	♂	18.5-20.1 (19.43)	97.5-109.0 (105.29)	144.0-161.0 (152.37)
	♀	19.4-21.4 (20.11)	100.0-109.0 (104.55)	142.0-154.0 (148.00)
<i>leucophaeus bondi</i>	♂	17.6-20.8 (19.40)	90.5-100.0 (95.40)	133.0-145.0 (139.30)
	♀	18.4-20.6 (19.66)	92.5-103.0 (97.21)	128.0-146.0 (138.71)
<i>leucophaeus nigrescens</i>	♂	20.9 — —	109.0 — —	151.0 — —
	♀	21.5 — —	105.0 — —	150.0 — —
<i>leucophaeus leucogenis</i>	♂	16.7-19.7 (18.32)	87.5- 99.5 (92.47)	120.5-135.5 (128.38)
	♀	18.6-19.6 (19.15)	97.5 — —	126.0 — —

TABLE 12—Continued

Form	Sex	Bill/Wing	O.T.F./Wing	O.T.F./C.T.F.
<i>leucophaeus salangensis</i>	♂	16.1–19.4 (18.26)	93.0–98.0 (95.31)	129.0–137.5 (131.86)
	♀	17.0–18.8 (18.35)	91.5–103.5 (96.62)	126.5–138.0 (130.62)
<i>leucophaeus innexus</i>	♂	18.7, 20.4 (19.55)	98.0, 99.5 (98.75)	138.0, 142.0 (140.00)
	♀	18.3–20.0 (19.33)	96.0–100.5 (98.66)	135.5–141.0 (137.50)
<i>leucophaeus stigmatops</i>	♂	19.4–20.7 (19.65)	89.0–94.5 (92.91)	132.0–137.0 (134.00)
	♀	20.2, 20.3 (20.25)	94.5, 96.0 (95.25)	130.0, 135.0 (132.50)
<i>leucophaeus phaedrux</i>	♂	18.7–21.2 (19.87)	89.5–97.5 (92.75)	129.0–139.0 (134.12)
	♀	21.0 — —	— — —	— — —
<i>leucophaeus batakensis</i>	♂	18.8–21.2 (20.14)	85.0–95.5 (91.50)	124.0–137.0 (131.20)
	♀	19.8–21.4 (20.72)	91.0–97.5 (94.16)	129.0–139.0 (134.00)
<i>leucophaeus periophthalmicus</i>	♂	19.6–21.8 (20.26)	91.5–98.5 (94.66)	129.0–138.0 (134.50)
	♀	19.3–21.0 (20.15)	96.0–98.5 (97.00)	122.0–131.0 (128.00)
<i>leucophaeus siberu</i>	♂	18.6–20.8 (19.86)	91.0–95.0 (93.50)	132.5, 136.0 (134.35)
<i>leucophaeus leucophaeus</i>	♂	18.2–21.4 (19.71)	93.0–100.5 (97.08)	128.0–143.0 (136.21)
	♀	19.0–22.1 (20.63)	94.0–102.5 (97.97)	125.0–139.0 (131.16)
<i>caerulescens caerulescens</i>	♂	18.5–20.1 (19.41)	92.0–99.0 (96.17)	131.0–140.0 (134.30)
	♀	18.8–21.8 (20.30)	93.0–100.0 (96.81)	129.0–136.0 (132.19)
<i>caerulescens insularis</i>	♂	20.7 — —	91.0 — —	132.5 — —
	♀	19.9 — —	93.0 — —	134.0 — —
<i>caerulescens leucopygialis</i>	♂	19.8–21.6 (21.07)	92.0–93.5 (92.62)	128.0–136.0 (131.00)
	♀	21.2 — —	91.5 — —	124.0 — —
<i>annectans</i>	♂	19.4–22.0 (20.48)	84.5–93.0 (87.61)	117.0–125.0 (122.00)
	♀	19.0–21.2 (20.46)	86.0–93.0 (88.00)	113.0–127.0 (120.54)
<i>aeneus aeneus</i>	♂	17.0–21.0 (18.90)	88.0–100.0 (94.10)	123.0–145.0 (134.72)
	♀	17.5–20.4 (19.22)	90.5–100.0 (94.90)	122.0–143.0 (134.00)
<i>aeneus malayensis</i>	♂	18.2–20.7 (19.17)	87.0–98.5 (91.50)	122.0–139.0 (125.50)
<i>aeneus braunianus</i>	♂	16.8–19.2 (18.04)	89.5–98.0 (94.00)	127.0–145.0 (135.00)
	♀	17.1–18.7 (18.26)	91.0–96.5 (94.14)	126.0–135.0 (131.36)
<i>balicassius balicassius</i>	♂	13.2–15.9 (14.75)	78.0–86.5 (81.50)	106.0–115.0 (109.40)
	♀	13.7–16.2 (15.16)	79.5–85.0 (82.36)	101.5–115.0 (109.90)
<i>balicassius abraensis</i>	♂	16.9, 17.0 (16.95)	76.5, 78.0 (77.25)	103.0, 105.0 (104.00)
	♀	16.8, 17.3 (17.05)	76.0, 76.5 (76.25)	99.0, 105.0 (102.00)
<i>balicassius mirabilis</i>	♂	15.6–17.0 (16.54)	80.5–87.0 (83.00)	105.0–114.5 (109.44)
	♀	16.4–18.6 (17.27)	79.5–86.0 (83.00)	104.0–110.0 (107.00)
<i>hottentottus samarensis</i>	♂	15.1–16.8 (16.22)	66.0–71.0 (68.12)	99.0–103.0 (101.00)
	♀	17.2–18.8 (17.63)	69.5–72.5 (71.40)	99.0–107.0 (102.50)
<i>hottentottus striatus</i>	♂	15.4–17.8 (16.42)	74.0–83.5 (77.77)	102.0–112.0 (106.10)
	♀	15.1–18.0 (16.51)	74.0–81.5 (78.43)	102.0–110.0 (105.57)
<i>hottentottus morotensis</i>	♂	13.2, 13.4 (13.30)	90.0 — —	116.0 — —
<i>hottentottus atrocaeruleus</i>	♂	12.1–14.8 (13.60)	87.0–95.0 (90.50)	106.0–117.0 (111.42)
	♀	13.2–14.8 (14.03)	86.0–94.0 (90.00)	108.0–111.0 (109.66)
<i>hottentottus carbonarius</i>	♂	13.5–16.4 (14.45)	84.0–97.5 (89.19)	109.0–124.0 (114.29)
	♀	13.2–16.0 (14.46)	83.0–94.5 (88.35)	107.0–120.0 (112.67)
<i>hottentottus bracteatus</i>	♂	13.9–16.0 (14.74)	76.5–89.5 (81.32)	109.0–117.0 (112.34)
	♀	13.9–15.7 (14.60)	78.0–89.0 (81.71)	107.0–116.0 (111.35)
<i>hottentottus laemostictus</i>	♂	13.5–16.4 (15.00)	85.5–95.0 (90.47)	112.5–122.0 (117.10)
	♀	13.5–16.5 (15.00)	85.5–93.0 (89.63)	109.0–122.0 (115.86)
<i>megarhynchus</i>	♂	14.0–14.8 (14.30)	202.0–213.0 (204.00)	241.0–258.0 (248.00)
	♀	14.2–15.8 (15.10)	186.0–221.0 (199.00)	223.0–247.0 (234.00)
<i>hottentottus meeki</i>	♂	15.1, 15.6 (15.35)	86.0, 90.5 (88.25)	106.5, 111.0 (108.75)
	♀	14.4 — —	91.0 — —	109.0 — —
<i>hottentottus longirostris</i>	♂	19.5–22.8 (21.24)	87.0–91.5 (89.25)	103.0–106.5 (105.57)
	♀	18.9–21.5 (20.30)	87.0–95.0 (89.60)	102.0–114.0 (105.16)

TABLE 12—Continued

Form	Sex	Bill/Wing	O.T.F./Wing	O.T.F./C.T.F.
<i>montanus</i>	♂	13.2–16.4 (14.42)	93.0–104.0 (98.50)	130.0–147.0 (138.50)
	♀	13.0–14.4 (13.80)	102.5–105.0 (103.75)	130.0–134.0 (132.00)
<i>hottentottus manumeten</i>	♂	16.3, 16.3 (16.30)	87.0, 91.0 (89.00)	114.0, 129.0 (121.50)
	♀	15.9, 17.6 (16.75)	88.0, 90.0 (89.00)	118.0, 125.0 (121.50)
<i>hottentottus amboinensis</i>	♂	14.8–16.5 (15.60)	90.0–94.5 (92.12)	116.0–123.0 (120.00)
	♀	15.6 — —	94.0 — —	121.0 — —
<i>hottentottus buruensis</i>	♂	15.2–15.7 (15.43)	104.0–112.0 (108.33)	127.0–135.0 (132.66)
	♀	— — —	— — —	130.0 — —
<i>hottentottus densus</i>	♂	15.7–16.8 (16.10)	111.0–114.0 (112.80)	132.0–141.0 (137.80)
	♀	15.3–16.5 (16.10)	109.0–112.0 (110.75)	132.0–137.0 (134.00)
<i>hottentottus kühni</i>	♂	15.5 — —	98.0 — —	120.0 — —
	♀	15.5–16.0 (15.83)	100.0–100.0 (100.00)	117.0–122.0 (119.50)
<i>hottentottus megalornis</i>	♂	15.3–16.0 (15.45)	100.0–103.0 (101.25)	116.0–121.0 (117.50)
	♀	14.9–16.3 (15.77)	100.0–100.0 (100.00)	114.0–121.0 (117.00)
<i>hottentottus sumbae</i>	♂	15.4–16.8 (16.00)	95.0–100.5 (97.85)	105.0–125.0 (116.57)
	♀	16.0–17.0 (16.40)	98.0–101.0 (99.00)	115.0–123.0 (119.00)
<i>hottentottus bimaënsis</i>	♂	14.6–16.2 (15.65)	81.5–90.0 (84.70)	102.0–116.0 (109.00)
	♀	15.6, 16.1 (15.85)	— — —	— — —
<i>hottentottus renschi</i>	♂	16.1–17.0 (16.47)	78.0–82.5 (79.83)	112.0–114.0 (113.00)
	♀	14.6 — —	77.5 — —	110.0 — —
<i>hottentottus sumatranus</i>	♂	13.1, 14.6 (13.85)	69.5, 71.5 (70.50)	105.0, 109.0 (107.00)
	♀	12.8, 13.4 (13.10)	70.5, 72.0 (71.25)	106.0, 106.0 (106.00)
<i>hottentottus guillemardi</i>	♂	14.3–15.6 (15.20)	86.0–88.5 (87.20)	112.0–118.0 (116.40)
	♀	14.0–15.6 (14.81)	83.5–88.5 (87.25)	109.0–115.0 (112.67)
<i>hottentottus pectoralis</i>	♂	15.7–16.3 (16.05)	78.5–88.0 (84.90)	103.0–114.0 (110.00)
<i>hottentottus leucops</i>	♂	13.6–16.3 (14.82)	84.0–94.0 (87.83)	111.0–125.0 (117.94)
	♀	13.8–16.3 (14.55)	81.0–94.5 (87.03)	106.0–122.0 (115.05)
<i>hottentottus jentinki</i>	♂	15.7–16.2 (16.00)	81.0–81.5 (81.25)	104.0–114.0 (110.00)
	♀	15.2–16.0 (15.65)	81.0–84.5 (82.50)	105.0–111.0 (108.25)
<i>hottentottus viridinitens</i>	♂	15.1–16.5 (15.85)	77.5–81.0 (78.85)	104.0–111.0 (108.00)
	♀	15.2–16.8 (15.72)	78.0–82.5 (79.83)	104.0–111.0 (108.25)
<i>hottentottus borneensis</i>	♂	13.7–16.0 (14.93)	77.0–80.0 (78.66)	108.0–116.0 (110.16)
	♀	14.6–16.4 (15.12)	77.0–80.5 (78.50)	106.0–113.0 (108.66)
<i>hottentottus suluensis</i>	♂	15.3–17.2 (16.10)	77.5–88.0 (84.67)	106.0–117.0 (113.66)
	♀	14.6–16.1 (15.24)	80.0–90.0 (84.00)	111.0–117.0 (113.66)
<i>hottentottus hottentottus</i>	♂	15.4–17.7 (16.67)	81.5–93.5 (85.85)	106.0–125.0 (113.19)
	♀	16.1–18.1 (16.93)	82.0–92.0 (86.87)	104.0–119.0 (112.66)
<i>hottentottus chrishna</i>	*	16.6–18.5 (17.31)	86.0–93.0 (89.85)	114.0–126.0 (120.08)
<i>hottentottus brevirostris</i>	♂	13.6–16.2 (14.90)	79.0–83.0 (81.25)	102.0–112.0 (107.00)
	♀	13.5–16.5 (14.63)	77.5–85.5 (80.16)	103.0–113.0 (107.46)
<i>hottentottus palawanensis</i>	♂	15.2–16.2 (15.70)	83.0–94.0 (87.83)	116.0–128.0 (120.58)
	♀	16.2–16.4 (16.30)	85.5–89.5 (87.33)	106.0–115.0 (111.00)
<i>hottentottus cuyensis</i>	♂	15.5–17.1 (15.92)	84.0–91.0 (87.37)	117.0–123.0 (120.33)
	♀	15.8, 16.2 (16.00)	89.0–90.0 (89.50)	117.0, 118.0 (117.50)
<i>hottentottus menagei</i>	♂	16.8–17.4 (17.07)	116.0–134.0 (129.00)	146.0–168.0 (159.33)
	♀	16.6–17.0 (16.83)	126.0–132.0 (129.66)	153.0–163.0 (158.33)
<i>andamanensis andamanensis</i>	♂	14.8–16.0 (15.27)	112.0–121.0 (116.55)	143.0–154.0 (147.66)
	♀	15.2–16.2 (15.63)	116.0–119.0 (117.33)	140.0–145.0 (142.66)

* Not separated as to sex.

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