

# ON A COLLECTION OF BIRDS FROM THE KRAKATAU GROUP OF ISLANDS, SUNDA STRAIT.

By

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Through the kindness of Dr. K. W. DAMMERMAN, Director of the Zoological Museum, Buitenzorg, Java I have had the privilege of examining a collection of birds made in the Krakatau group of volcanic islets situated in the Sunda Strait between Sumatra and Java.

The volcanic eruption of Krakatau in August 1883, one of the greatest natural catastrophes known to man, has been described in detail in many places. The eruption provided naturalists with an unique opportunity for studying the genesis and development of an island fauna and of late years the biologists in the Netherlands Indies have exploited this opportunity to the full. In the now extensive bibliography dealing with the group special attention can be directed to a paper by Dr. K. W. DAMMERMAN in "Treubia", III, 1922, pp. 61-112, wherein are a sketch map, general discussions concerning the biology of the islands with a recapitulation of the problems involved and lists of the new fauna.

Whether or not any form of animal life could have survived the layer of hot ashes many metres thick is not a subject for discussion here, but it is at least certain that the birds must have been driven away, or destroyed.

Unfortunately we have no knowledge concerning the birds prior to the eruption. Knowledge subsequently acquired has been brought up-to-date by Dr. DAMMERMAN in the paper quoted above which is too fresh to need repeating in detail.

The present collection includes all the specimens mentioned in that paper obtained by the Zoological Museum, Buitenzorg, together with the material yielded by subsequent visits to the islands by officials of that institution.

The main object here has been to enquire as deeply as possible into the subspecific identity of the birds with a view to finding out from which directions the islands of Krakatau, Verlaten Island and Lang Island are being repopulated.

The collection adds to our knowledge in several directions.—

1. A few minor extensions of range within the group of species already recorded from the islands are, perhaps, not very important. *Dryobates m. moluccensis* is now known to extend to Verlaten and *Leptocoma jugularis microleuca* to Lang Island.

2. Additions to the lists of wandering coastal birds and true migrants are also relatively unimportant, for the migratory wave reaches Christmas Island in the Indian Ocean and further collecting in the Krakatau group will no doubt add many more names to the avifauna. The following species are here recorded for the first time. — *Arenaria i. interpres*, *Tringa nebularia*, *Charadrius apricarius fulvus*, *Alcedo atthis bengalensis*, *Alseonax l. latirostris*, *Zanthopygia narcissina zanthopygia* and *Acrocephalus stentoreus orientalis*.

3. The addition of two non-migratory species, *Macropygia phasianella emiliana* (Verlaten I.) and *Gerygone fusca sulphurea* (Krakatau and Verlaten I.) is more interesting. They are probably new-comers for it is unlikely that they were overlooked by previous collectors, one being a large, striking species and the other common in the islands.

4. The most noteworthy fact brought out by the present collection is that *Cyornis rufigastra rhizophorae*, which up to 1922 was only known from Sebesy, is now widely spread in the group. It is common on Krakatau; it breeds on Verlaten I., and it occurs on Lang Island. It seems reasonable to believe that fourteen years ago it was very rare and that its present status in the islands has only recently been attained.

The following brief analysis excludes Sebesy.—

1. Even before the eruption had died down migratory birds must have passed the islands and when the hot ashes cooled some of these birds were no doubt, among the first visitors. The following species are known to occur. — *Arenaria i. interpres*, *Tringa hypoleucos*, *Tringa nebularia*, *Numenius phaeopus*, *Charadrius l. leschenaultii*, *Charadrius apricarius fulvus*, *Astur*, or *Accipter* sp. (probably *A. virgatus gularis*), *Hirundo rustica gutturalis*, *Zanthopygia narcissina zanthopygia*, *Alseonax l. latirostris*, *Acrocephalus stentoreus orientalis*, *Lanius cristatus superciliosus* and *Motacilla flava similima*.

2. The widely spread sea-birds also form a group by themselves of no great interest to the zoo-geographer. — *Chlidonias leucoptera grisea*, *Sterna maethetus* (or *S. fuscata nubilosa*), *S. dougalli bangsi*, *S. bergii cristata*, *S. s. sumatrana*, *Fregata* sp., and *Oceanodroma leucorhoa monorhis*. A tern of some kind was found breeding on Verlaten I. in 1919.

3. A third group consists of well-known wanderers, birds of the coast and mangrove swamps and species that habitually stray far afield in their daily foraging excursions. Such species give no clue as to the direction from which the islands were repopulated and they have, no doubt, always wandered along the coasts of the Sunda Straits and between Java and Sumatra using the small islands as stepping stones. — *Myristicivora bicolor bicolor*, *Esacus ragnirostris scommiphorus*, *Butorides striatus javanicus* (but perhaps the migratory subspecies, *amurensis*), *Demigretta s. sacra*, *Haliaeetus leucogaster*, *Taliastur indus intermedius*, *Halcyon chloris cyanescens*, *Alcedo atthis bengalensis*, *Micropus* sp. ("short forked tail and white rump"), and *Collocalia* sp. One of these (*Halcyon*) already breeds on Krakatau and Verlaten I. and several of the other species are also likely to settle down at any time.

4. Most important of all are the true non-migratory land-birds of which twenty-seven species have now been recorded from the islands and at least ten and perhaps eleven species, for oviduct eggs have been found in *Caprimulgus affinis*, breed locally. In this section I have included *Alcedo coerulescens*, but I know nothing of the habits of this small kingfisher and perhaps it should be included in section three, above. *Eudynamys scolopaceus malayanus* is also included although there is just a possibility that the birds are not resident.

(a). Nineteen of these non-migratory land birds occur in the same form in Sumatra and West Java. They therefore furnish no clue as to the exact provenance of the birds although as stated below there is reason for suspecting that the *Oriolus* is from Sumatra. — *Treron vernans griseicapilla*, *Geopelia s. striata*, *Chalcophaps i. indica*, *Macropygia phasianella emiliana*, *Amaurornis phoenicurus javanicus*, *Eudynamys scolopaceus malayanus*, *Centropus bengalensis javanicus*, *Caprimulgus a. affinis*, *Dryobates m. moluccensis*, *Hirundo tahitica javanica*, *Anthreptes m. malacensis*, *Lalage n. nigra*, *Artamus leucorhynchus amydrus*, *Pachycephala cinerea butaloides*, *Gerygone fusca sulphurea*, *Lanius schach bentet*, *Oriolus chinensis maculatus*, *Corvus m. macrorhynchus* and *Aplonis panayensis strigatus*.

(b). In the case of the remaining eight forms, four are Javan in origin and three Sumatran. The Javan forms are *Alcedo coerulescens*, *Dicaeum trigonostigmum flaviclune*, *Pycnonotus a. aurigaster* and *Cyornis rufigaster rhizophorae*. The Sumatran forms are *Leptocoma jugularis microleuca*, *Copsychus saularis musicus* and *Pycnonotus goiavier personatus*. The affinities of one form occurring on Verlaten (*Centropus sinensis* subsp.) have not been determined.

(c). The breeding forms are. — *Chalcophaps* (V.K.), *Amaurornis* (V.), *Centropus javanicus* (K.), *Halcyon chloris* (K.), ? *Caprimulgus affinis* (?K., ?V.), *Leptocoma* (V.), *Pycnonotus goiavier* (V.), *Cyornis* (V.), *Oriolus* (K.), *Aplonis* (V.), and *Lanius schach bentet* (K.V.).

The reoccupation of the Krakatau islands by birds seems to be proceeding in a casual rather than a regular manner. Two species observed in 1908, *Pycnonotus aurigaster* and *Alcedo coerulescens* ("berylina"), both Javan forms be it noted, have failed to establish themselves and *Lanius bentet* found in 1908 and reported as breeding in Verlaten I. and Krakatau in 1919 has not been obtained since 1920. It is certain that the list of casual visitors from both sides of the straits will grow and some of the species will, no doubt, establish themselves. On the neighbouring islet of Sebesy occur several forms not yet known from the Krakatau islets. — *Cacomantis* subsp., *Arachnothera l. longirostra*, *Geokichla interpres*, *Orthotomus sepium ruficeps*, *Munia punctulata fretensis* and *Kittacincla malabarica tricolor*. I have examined no example of the *Cacomantis*; the *Kittacincla* and *Geokichla* are common to Sumatra and Java and the other three forms are Sumatran, but not Javan. On the Java side, from the small island of Meeuwen, I have seen in a small collection such characteristic Javan forms as *Cyanops a. australis*, *Hypothymis azurea javanica*, *Aegithina*

*tiphia scapularis*, *Orthotomus s. sepium* and *Dicaeum t. trochileum*. The situation is interesting for in several cases distinct subspecies of one species are facing each other and separated by only a few miles of sea.

To summarize, it can be said that the bird-life of the Krakatau islets, annihilated in 1883 is now, fifty-four years later, abundant, but the resident population is not static, the lists of non-migratory and even breeding species made in 1908, 1922 and 1933 not being identical. The repopulation of the islands seems to have taken place in a thoroughly normal manner by forms, in the majority of cases, common to the lowlands of the adjacent mainlands and in the minority of cases by forms peculiar to one side, or the other, in about equal numbers. In no case have two subspecies of one species yet been recorded from any one island and I can discover no evidence of local differentiation, or any anomalous feature among the records, or collections examined.

#### COLUMBIDAE.

*Treron vernans griseicapilla* SCHLEG. (*Osmotreron vernans*, D.)<sup>1)</sup>.

Krakatau. — 1 ♀, 7.1.33, D.; 1 ♂, 1 ♀, 1.5.33, D.; 1 ♂, 1 ♀, 7.4.34, M.; 1 ♂, 9.4.34, M.

Sebesy. — 1 ♀, 21.4.21, S.; 1 ♂, 24.4.21, S.

Birds from South Sumatra and West Java seem alike.

*Myristicivora bicolor bicolor* (SCOP.).

Krakatau. — 1 ♀, 22.9.20, S.

Found in both Sumatra and Java.

*Macropygia phasianella emiliana* BP.

Verlaten I. — 1 ♂, 6.1.33, D.

This form is common to both Java and Sumatra.

*Chalcophaps indica indica* (LINN.).

Krakatau. — 1 ♂, 22.9.20, S.; 2 ♀, 23.9.20, S.; 1 ♀, 22.7.24, D.

Verlaten I. — 1 ♂, 6.1.33, D.; 1 ♂, 10.12.33, D.; 1 ♂, 11.12.33, M.

Sebesy. — 1 ♂, 21.4.21, S.; 1 ♀, 29.4.21, S.

Found in both Sumatra and Java.

#### RALLIDAE.

*Amaurornis phoenicurus javanicus* (HORSF.).

Sebesy. — 1 ♂, 28.4.21, S.

Found in both Sumatra and Java.

#### LARIDAE.

*Sterna bergii cristata* STEPH.

Verlaten I. — 2 ♂, 1 ♀, 28.9.20, D. and S.

Widely distributed in Malaysian Seas.

<sup>1)</sup> Where the names used here differ markedly from those used in Dr. DAMMERMAN's paper the latter are also given, in brackets. The capital letters are the initials of the collectors. — D., Dr. K. W. DAMMERMAN; S., Mr. H. C. SIEBERS; M., a Sundanese collector, MADZOED.

*Sterna dougallii bangsi* MATHS.

Verlaten I. — 4 ♂, 4 ♀, 28.9.20, D. and S.

Widely distributed in Malaysian Seas.

*Sterna sumatrana sumatrana* RAFFLES (*S. melanauchen*, D.).

Verlaten I. — 1 ♂, 6 ♀, 1 ex. 27.9.20, S.

Widely distributed in Malaysian Seas.

## Fam. HYDROBATIDAE.

*Oceanodroma leucorhoa monorhis* (SWINH.).

Verlaten I. — 1 ♀, 23.10.21, D.

A wandering sea-bird.

## BURHINIDAE.

*Esacus magnirostris scommophorus* (OBERH.). (*Orthoramphus magnirostris*, D.).

Verlaten I. — 1 ♀, 26.9.20, S.

Found in both Sumatra and Java.

## SCOLOPACIDAE.

*Arenaria interpres interpres* (LINN.).

Verlaten I. — 1 ♂, 1 ♀, 12.11.32, D.

A migrant.

*Tringa hypoleucos* LINN.

Verlaten I. — 2 ♀, 27.9.20, S.; 10.12.33, D.

Sebesy. — 1 ♀, 29.9.20, S.

A migrant.

*Tringa nebularia* (GUNN.).

Verlaten I. — 1 ♂, 12.11.32, D.

A migrant.

## CHARADRIIDAE.

*Charadrius apicarius fulvus* GMEL.

Verlaten I. — 1 ♂, 12.11.32, D.

A migrant.

*Charadrius leschenaultii leschenaultii* LESS. (*Ochthodromus geoffroyi*, D.).

Verlaten I. — 1 ♀, 26.4.21, S.

A migrant.

## ALCEDINIDAE.

*Halcyon chloris cyanescens* (OBERH.).

Krakatau. — 1 ♀, 22.9.20, S.; 1 ♂, 20.7.24, D.; 1 ♂, 1.5.33, D.

Sebesy. — 1 ♀, 22.4.21, D.

Found in both South Sumatra and West Java.

*Alcedo atthis bengalensis* GMEL.

Verlaten I. — 1 ♂, 9.12.33, M.

Found in both South Sumatra and West Java.

## CAPRIMULGIDAE.

*Caprimulgus affinis affinis* HORSF.

Krakatau. — 1 ♀, 25.9.20, S.

Verlaten I. — 1 ♂, 26.9.20, S.; 1 ♀, 28.9.20, S.; 1 ex. 16.2.28, D.; 1 ex. 2.5.29, D.; 1 ♂, 5.1.33, D.

Common to Sumatra and Java.

## CUCULIDAE.

*Eudynamys scolopaceus malayanus* CAB. and HEINE. (*E. honorata*, D.).

Krakatau. — 1 ♀, 22.9.20, D.; 1 ♂, 23.9.20, D.

Verlaten I. — 1 ♀, 27.9.20, S.; 1 ♂, 9.12.33, M.

Sebesy. — 1 ♂, 29.9.20, D.; 1 ♂, 22.4.21, D.; 1 ♂, 24.4.21, S.

Common to both Sumatra and Java.

*Centropus sinensis eurycercus* HAY.

Sebesy. — 1 ♂, 29.9.20, S.

This is the race occurring in Sumatra: Javan birds (*bubutus*) run rather heavier in the bill.*Centropus bengalensis javanicus* (DUM.).

Krakatau. — 1 ♀, 9.4.34, M.

Verlaten I. — 1 ♀, 26.9.20, S.

Birds from Sumatra and Java seem alike.

*Chalcites basalis* (HORSF.). (*Chalcococcyx basalis*, D.).

Sebesy. — 1 ♀, 28.4.21, S.

A migrant.

## PICIDAE.

*Dryobates moluccensis moluccensis* (GMEL.). (*Iyngipicus auritus*, D.).

Krakatau. — 1 ex. 12.11.32, M.; 1 ♂, 8.1.33, D.

Verlaten I. — ♂, 11.11.32, M.; 1 ♂, 5.1.33, D.; 1 ♀, 6.1.33, D.

Sebesy. — 1 ♂, 23.4.21, D.; 1 ♂, 28.4.21, D.

Common to Sumatra and Java.

## MUSCICAPIDAE.

*Cyornis rufigastra rhizophorae* STRES. (*Siphia* spec., D.).

Krakatau. — 1 ♂, 4.5.29, D.; 1 ♂, 1 ♀, 23.8.30, D.; 1 ♂, 1 ♀, 10.11.32, M.; 1 ♂, 12.11.32, M.; 1 ♂, 1 ♀, 7.1.33, D.; 1 ♂, 8.1.33, D.; 1 ♀, 29.4.33, D.; 1 ♂, 18.10.33, D.; 2 ♀, 6.4.34, M.; 1 ♀, 9.4.34, M.

Verlaten I. — 1 ♂ juv., 24.8.30, D.; 1 ♀, 30.4.33, D.

Sebesy. — 1 ♂, 1 ♀, 22.4.21, S.; 1 ♂, 2 ♀, 24.4.21, S.; 1 ♂, 25.4.21, S.

Lang I. — 1 ♂, 1 ♀, 9.11.32, M.

The juvenile from Verlaten I. is little more than a nestling and must have been bred on the island.

The Javan, not the Sumatran, race.

*Gerygone fusca sulphurea* WALL.

Krakatau. — 2 ♂, 1 ex., 10.11.32, D. and M.; 1 ♀, 29.4.33, D.; 1 ♀, 18.10.33, D.; 1 ♂, 8.4.34, M.

Verlaten I. — 1 ♂, 11.11.32, D.; 1 ♀, 5.1.33, D.; 1 ♂, 30.4.33, D.; 1 ♀, 16.10.33, D.; 1 ♀, 10.12.33, M.

This race occurs in both Sumatra and West Java.

*Alcedo latirostris latirostris* (RAFFLES).

Verlaten I. — 1 ♂, 11.11.32, D.

A migrant.

*Zanthopygia narcissina zanthopygia* (HAY).

Krakatau. — 1 ♂, 10.11.32, D.

A migrant.

#### CAMPEPHAGIDAE.

*Lalage nigra nigra* (FORST.). (*Lalage terat*, D.).

Krakatau. — 1 ♂, 7.4.34, D.

Verlaten I. — 1 ♂ (? ♀), 6.1.33, D.; 1 ♂, 10.12.33, D.

This race occurs in both South Sumatra and West Java.

#### PYCNONOTIDAE.

*Pycnonotus goiavier personatus* (HUME). (*Pycnonotus analis*, D.).

Krakatau. — 1 ♂, 7.1.33, D.; 1 ♂, 1 ♀, 8.1.33, D.; 1 ♀, 7.4.34, M.

Verlaten I. — 1 ex., 2.5.29, D.; 1 ex., 3.5.29, D.; 1 juv. ♂, 16.10.33, D.

Sebesy. — 1 ♂, 22.4.21, S.

When birds from Sumatra (*personatus*) are compared with others from Central and East Java (*analis*) a difference is at once obvious: the former have whiter superciliaries and ear-coverts. The distinction, however, is less noticeable when *personatus* is compared with material from West Java and in a minority of cases I can make no separation. The Krakatau-group series includes some very white-headed birds such as seem never to occur in Java and is therefore referred to the Sumatran race.

The juvenile from Verlaten I. must have been bred locally.

#### TURDIDAE.

*Copsychus saularis musicus* RAFFLES.

Krakatau. — 1 ♂, 1 ♀, 9.4.34, M.

Verlaten I. — 1 ♀, 12.12.33, M.

The Sumatran, not the West Javan, subspecies.

*Kittacincla malabarica tricolor* (VIEILL.).

Sebesy. — 1 ♂, 1 ♀, 28.4.21, S.

Birds from South Sumatra and West Java seem inseparable.

*Geokichla interpres interpres* (TEMME.).

Sebesy. — 1 ♀, 22.4.21, S.

It has not yet been demonstrated that Sumatran birds differ from Javan topotypes.

#### SYLVIIDAE.

*Orthotomus sepium ruficeps* (LESS.). (*Orthotomus* spec., D.).

Sebesy. — 1 ♂, 24.4.21, S.

The Sumatran subspecies. The Javan form occurs on Meeuwen Island.

*Phylloscopus borealis borealis* (BLAS.).

Sebesy. — 1 ♂, 1 ♀, 25, 29.4.21, D. and S.

A migrant.

*Acrocephalus stentoreus orientalis* (TEMME. & SCHLEG.).

Krakatau. — 1 ♂ 8.4.34, D.

A migrant.

#### LANIIDAE.

*Lanius cristatus superciliosus* LATH.

Krakatau. — 2 ♂, 25.9.20, S.

A migrant.

*Pachycephala cinerea butaloides* STRES. (*Pachycephala grisola*, D.).

Krakatau. — 1 ♂, 23.9.20, S.; 1 ♀, 21.7.24, D.; 1 ♂, 1 ♀, 10.11.32, M.; 1 ♀, 8.1.33, D.; 2 ♀, 18.10.33, D.; 1 ♀, 7.4.34, M.; 1 ♂, 9.4.34, M.

Verlaten I. — 1 ♀, 26.9.20, S.; 1 ♂, 26.4.21, S.; 1 ♂, 5.1.33, D.; 1 ♂, 11.12.33, M.

Sebesy. — 1 ♂, 21.4.21, D.

The subspecies *butaloides* was described from West Java, but it is widely spread in Malaysia also occurring in Sumatra.

#### ARTAMIDAE.

*Artamus leucorhynchus amydrus* OBERH.

Krakatau. — 1 ♂, 1.5.33, D.

Verlaten I. — 1 ex., 2.5.29, D.

The species occurs in the same form in Sumatra and Java.

#### DICAEIDAE.

*Dicaeum trigonostigmum flaviclune* HART.

Krakatau. — 1 ♀, 29.4.33, D.; 1 ♂, 1.5.33, D.; 1 ♂, 6.4.34, M.

Verlaten I. — 1 ♂, 26.4.21, S.

Clearly belonging to the Javan subspecies and not to the much more brightly coloured typical form which inhabits Sumatra (*terr. typ.*, Malacca).

The collection also contains a male from Sebesy (28.4.21, S.), but it is too young for subspecific identification which is most unfortunate as an exact identification of this skin would have been one of the most interesting in the collection. It is not improbably an example of the typical form.

## NECTARINIIDAE.

*Leptocoma jugularis microleuca* (OBERH.). (*Cinnyris pectoralis*, D.).

Krakatau. — 1 ♂, 28.4.33, D.; 1 ♀, 6.4.34, D.; 1 ♂, 8.4.34, M.

Verlaten I. — 1 ♀, 27.9.20, S.; 1 ♂, 6.1.33, D.; 1 ♀, 9.12.33, M.; 2 ♂, 11.12.33, M.

Sebesy. — 1 ♂, 24.4.21, S.

Lang I. — 1 ♂, 1 ♀, 9.11.32, M.

In their published papers Messrs ROBINSON and KLOSS always regarded Sumatran birds of this species as inseparable from the Javan subspecies (*pectoralis*) and indeed birds from all over Malaysia are so much alike that with the exception of the northern *flammarillaris* (Tenasserim), (regarded by some authors as a full species) any further subdivision is speculative. I have, however, in my "Handlist" confined *pectoralis* to the Javan province and used *microleuca* (*terr. typ.*, Taya Island, South-east Sumatra) for all Malaysian birds from non-Javan localities because they usually have rather more robust bills than topotypes of *pectoralis*, but the difference is by no means constant and *microleuca* is a very poor race.

From Krakatau and the other small islands under consideration at present four adult males with undamaged bills are available for comparison. The shortest bill in this small series is just longer than the bill in any of five out of six adult males from Java and the birds from the Krakatau islets therefore seem best referred to the non-Javan subspecies.

*Anthreptes malacensis malacensis* (SCOP.).

Krakatau. — 1 ♂ juv., 21.7.24, D.

Verlaten I. — 1 ♂, 11.12.33, M.; 1 ♂ imm., 9.12.33, M.

Sebesy. — 1 ♂ imm., 1 ♀, 21.4.21, D.; 1 ♂, 24.4.21, D.; 1 ♀, 29.4.21, D.

Common to both Java and Sumatra.

*Arachnothera longirostra longirostra* (LATH.).

Sebesy. — 1 ex., 21.4.21, D.

Definitely of the typical race (*terr. typ.*, Bengal) which occurs in South Sumatra. In West Java a very distinct form (*prillwitzii* HART.), is found.

## MOTACILLIDAE.

*Motacilla flava simillima* HART.

Krakatau. — 1 ♂, 25.9.20, S.

A migrant.

*Motacilla cinerea melanope* PALL.

Sebesy. — 1 ♂, 29.9.20, S.

A migrant.

## PLOCEIDAE.

*Munia punctulata fretensis* KLOSS. (*M. nisoria*, D.).

Sebesy. — 1 ad., 1 imm., both unsexed, 29.4.21, S.

The immature bird is too young to identify subspecifically with any degree of certainty, but the adult belongs to the race inhabiting Sumatra, where it is found in the Lampongs (*terr. typ.*, Selangor, Malay States) and not to the Javan form.

## GRACULIDAE.

*Aplonis panayensis strigatus* (HORSF.). (*Calornis chalybea*, D.).

Krakatau. — 1 ♂, 22.9.20, S.; 1 ♀, -7.24, D.; 1 ♂, 12.11.32, M.; 1 ♂, 1 ♀, 29.4.33, D. Wings, ♂ 95, 99, 95, 99; ♀, 92 mm.

Verlaten I. — 2 ♂, 5.1.33, D. M.; 1 ♂, 30.4.33, D.; 1 ♀, 8.12.33, M. Wings, ♂, 97, 101, 99; ♀, 95 mm.

Sebesy. — 2 ♀, 25.4.21, S. Wings. 89, 96 mm.

Birds from South Sumatra and West Java seem to be exactly alike.

## ORIOOLIDAE.

*Oriolus chinensis maculatus* VIEILL.

Krakatau. — 2 ♂, 22.9.20, S.; 1 ♂, 1 ♀, 21.7.24, D.; 1 ♂, 22.7.24, S.; 1 ex. 4.5.29, D.; 2 ♂, 7, 8.1.33, D.

Verlaten I. — 1 ♂, 26.4.21, S.

Sebesy. — 1 ♀, 22.4.21, S.

Sumatran and Javan birds are always referred to the same race, *maculatus* (*terr. typ.*, Java) and a slightly larger average size of the bill in Sumatran specimens is the only distinction I can detect in a re-examination of the available material. Measured from the anterior point of the nostril the bills of topotypical males from Java measure 20.4 - 22.4 against 21.1 - 24 mm in Sumatran males. Females give 20 - 21.4 against 21.5 - 22 mm. The adult Krakatau birds together with a male from Verlaten and a female from Sebesy give 22.2 - 23.1 mm for males and 21.5 - 23.3 mm for females. The distinctions are not great (the short, but certain, measurement given tends to minimize the difference, but in the skins the more robust bills of some of the Sumatran birds are very noticeable), and on the material, I should not care to separate a Sumatran race, but there is at least a suggestion here that the birds under notice come from the Sumatran stock.

One of the males (21st July) from Krakatau is very young and retains traces of the juvenile plumage; it is, however, full grown and could, I should say, have crossed from the mainland.

## CORVIDAE.

*Corvus macrorhynchos macrorhynchos* WAGL.

Krakatau. — 1 ♂, 25.9.20, S.

Verlaten I. — 1 ♂, 26.4.21, S.

The species occurs in the same form in the lowlands of Sumatra and West Java.

A SUMMARY OF THE AVIFAUNA OF KRAKATAU, VERLATEN ISLAND, LANG ISLAND AND SEBESY.  
 The + crosses represent the increase in knowledge during the period 1924 - 1934.

Name	Distribution				Status							Dates			Remarks	
	Krakatau	Verlaten Island	Lang Island	Sebesy	Resident Land Birds		Breeding			Other Birds		1908	1919 - 21	1924 - 34		
					Sumatra and Java	Sumatra	Java	Krakatau	Verlaten Island	Lang Island	Sebesy					Migrants
<b>LUMBIDAE</b>																
<i>ron vernans griseicapilla</i> SCHLEG.	×	×		×	×								×	×	×	<i>Osmotreron verna</i>
<i>isticivora b. bicolor</i> SCOP.	×	×		×									×	×		
<i>ropygia phasianella emiliana</i> BP.		+			×	×									+	
<i>pelia s. striata</i> L.	×				×	×								×	×	
<i>scophaps i. indica</i> L.	×	×		×	×		×	×		×			×	×	×	
<b>LLIDAE</b>																
<i>urornis phœnicurus javanica</i> HORSF.	×	×		×	×			×						×	×	
<b>RHINIDAE</b>																
<i>cus magnirostris commophorus</i> OBERH.		×		×									×	×		
<b>ARADRIIDAE</b>																
<i>radrius apricarius fulvus</i> GMEL.		+													+	
<i>radrius l. leschenaultii</i> LESS.		×		×										×		<i>Ochthodromu geoffro.</i>
<b>DLOPACIDAE</b>																
<i>maria i. interpres</i> L.		+													+	
<i>menius phaeopus variegatus</i> SCOP.	×			×												
<i>nga hypoleucos</i> L.	×	×		×										×	×	
<i>nga nebularia</i> GUNN.		+													×	
<b>RIDAE</b>																
<i>donias leucoptera grisea</i> HORSF.	×	×												×	×	<i>Hydrochelido leucoptei</i>
<i>na bergii cristata</i> STEPH.		×												×	×	
<i>na dougallii bangsi</i> MATHS.		×												×	×	A species of <i>S</i> breeds on Ve (



Name	Distribution				Status							Dates			Remarks		
	Krakatau	Verlaten Island	Lang Island	Sebesy	Resident Land Birds			Breeding			Other Birds		1908	1919 — 21		1924 — 34	
					Sumatra and Java	Sumatra	Java	Krakatau	Verlaten Island	Lang Island	Sebesy	Migrants					Widely-spread sea birds
<i>ynamys scolopaceus</i>																	
<i>yanus</i> CAB. & HEIN.	×	×		×	×										×	×	<i>E. honorata</i> , No bird exam from Verl
<i>tropus sinensis cary-</i> <i>cercus</i> HAY.		×		×		×									×		
<i>tropus bengalensis</i>																	
<i>javanicus</i> DUM.	×	×		×	×			×					×	×	×		
<i>leites basalis</i> HORSF.				×							×				×		
ALCIPEDIDAE																	
<i>obates m. moluccensis</i> GMEL.	×	+		×	×										×	×	
ALCIPEDIDAE																	
<i>undo rustica guttu-</i> <i>ralis</i> SCOP.	×	×									×				×		
<i>undo tahitica javanica</i> SP.	×	×		×	×										×		
ALCIPEDIDAE																	
<i>rnis rufigastrea rhizo-</i> <i>phorae</i> STRES.	+	+	+	×			×		+						×	×	<i>Siphia spec.</i> ,
<i>ygone fusca sulphurea</i> WALL.	+	+			×											+	
<i>sonax l. latirostris</i> RAFF.		+									×					+	
<i>thopygia narcissina</i> <i>zanthopygia</i> HAY.		+									×					+	
ALCIPEDIDAE																	
<i>age n. nigra</i> FORST.	×	×		×	×										×	×	
ALCIPEDIDAE																	
<i>nonotus goavier per-</i> <i>sonatus</i> HUME.	×	×		×		×			+		×			×	×	×	
<i>nonotus a. aurigaster</i> VIEILL.	×						×							×			
ALCIPEDIDAE																	
<i>syechus saularis musi-</i> <i>cus</i> RAFF.	×	×				×									×	×	

Name	Distribution				Status						Dates		Remarks			
	Krakatau	Verlaten Island	Lang Island	Sebesy	Resident Land Birds			Breeding			Other Birds					
					Sumatra and Java	Sumatra	Java	Krakatau	Verlaten Island	Lang Island	Sebesy	Migrants		Widely-spread sea birds	Coastal birds and wanderers	
												1908	1919 -- 21	1924 -- 34		
<i>cincla malabarica</i>																
<i>tricolor</i> VIEILL.				×	×										×	
<i>ichla interpres</i>																
TEMM.				×	×										×	
VIIDAE																
<i>otomus sepium</i>																
<i>ruficeps</i> LESS.				×		×									×	<i>cineraceus</i> auct
<i>loscopus b. borealis</i>																
BLAS.				×						×					×	
<i>cephalus stentoreus</i>																
<i>orientalis</i> T. + S.	+									×					+	
AMIDAE																
<i>nus leucorhynchus</i>																
<i>amydrus</i> OBERH.	×	×		×	×								×	×	×	
IDAE																
<i>is cristatus superci-</i>																
<i>liosus</i> LATH.	×									×					×	
<i>is schach bentet</i>																
HORSF.	×	×			×			×	×				×	×		
<i>vcephala cinerea</i>																
<i>butatoides</i> STRES.	×	×		×	×										×	<i>Pachycephala</i> <i>grisola</i>
EIDAE																
<i>um trigonostigmum</i>																
<i>flaviiclune</i> HART.	×	×		?		×							×	×	Subspecies on besy uncert	
PARINIIDAE																
<i>coma jugularis</i>																
<i>microleuca</i> OBERH.	×	×	+	×		×			×				×	×	<i>Cinnyris pector</i> <i>alts</i>	
<i>eptes m. malacensis</i>																
SCOP.	×	×		×	×								×	×		
<i>nothera l. longifos-</i>																
<i>tris</i> LATH.				×	×								×			

Name	Distribution						Status			Dates			Remarks			
	Krakatau	Verlaten Island	Lang Island	Sebesy	Resident Land Birds		Breeding			Other Birds		1908		1919 — 21	1924 — 34	
					Sumatra and Java	Sumatra	Java	Krakatau	Verlaten Island	Lang Island	Sebesy					Migrants
<b>TACILLIDAE</b>																
<i>Tacilla flava simillima</i> HART.	×	×											×			
<i>Tacilla cinerea melanope</i> PALL.				×									×			
<b>ALCEDIDAE</b>																
<i>Alcedo punctulata fretensis</i> KL.				×		×								×		<i>M. nisoria</i> , D.
<b>ALCEDIDAE</b>																
<i>Alcedo panayensis strigatus</i> HORSEF.	×	×		×		×				×				×	×	
<b>ALCEDIDAE</b>																
<i>Alcedo chinensis maculatus</i> VIEILL.	×	×		×		×		×					×	×	×	
<b>ALCEDIDAE</b>																
<i>Alcedo m. macrorhynchus</i> WAGL.	×	×		×		×							×	×		