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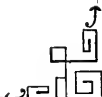

CONTINUED BY

Dr. F. A. JENTINK,

Director of the Museum.

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VOL. XXI.  
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LATE E. J. BRILL
PUBLISHERS AND PRINTERS.
— LEYDEN. — 1899/1900.



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- Schlegel (H.)**, Monographie des Singes. 1876. 8°. f 4.75
 ——— Oiseaux des Indes Néerl., décrits et fig. (f 34,80) gr. in-4°. f 25.—
- Snellen (P. C. T.)**, De vlinders van Nederland, Microlepidoptera, systematisch beschreven. 2 dln. 1882. gr. 8°. Met 14 pl. . . f 15.—

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E. J. BRILL

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NOTE I.

DAS GENUS GRACULA LINN.¹⁾ UND SEINE ARTEN
NEBST BESCHREIBUNG EINER NEUEN ART

VON

Dr. O. FINSCH.

(Tafel 1 und 2).

Das hervorragendste Kennzeichen der Arten dieser Gattung bilden zwei unterhalb des Hinterkopfes entspringende, horizontal hervorstehende, blattförmige, fleischige Nackenlappen, deren Form und Grösse am besten durch die beigegebenen Abbildungen veranschaulicht wird, soweit dies nach ausgestopften Exemplaren oder Bälgen möglich ist. Dasselbe gilt in Bezug auf den nackten Fleck unter dem Auge, der durch die Art der Präparation häufig verzerrt und verschoben wird, so dass sich die ursprüngliche Form dieses Hautfleckes, sowie die Ausdehnung des hinter demselben sich anschliessenden Federfeldes nicht immer so getreu wiedergeben lässt als nach dem Leben. Der nackte Hautfleck unter dem Auge fehlt übrigens bei einer Art (*ptilogenys*, N^o. 10) ganz. Bei jungen Vögeln sind die Nackenlappen mehr oder minder rudimentär, zuweilen nur eine Hautfalte (s. Fig. 4) und selbst diese fehlt sogar an einem

1) Siehe Salvadori (Annali del Mus. Civ. di Genova, 1892, p. 137, Note) der nachweist, dass Linnés Gattung „*Gracula*“, trotz der verschiedensten unter diesem Namen eingereihten Arten (die ganz anderen Genera angehören), auf *G. religiosa* begründet wurde und deshalb erhalten bleiben muss. Uebrigens giebt auch Wagler (Syst. av. 1827) eine treffliche Beschreibung des Genus *Gracula* (Typus „*G. religiosa* Wagl.“ = *javanensis* Osbeck).

alten Vogel unseres Museums gänzlich (s. *G. javanensis*, M. S. Cat. N^o. 38).

Die Nackenlappen, wie der nackte Fleck unter dem Auge, Schnabel und Füsse, sind im Leben sehr lebhaft (gelb, orange bis roth) gefärbt. Ich verzichte aber die hierauf bezüglichen Notizen wiederzugeben, weil dieselben zu zahlreich sind, sich überdies zuweilen widersprechen und verweise auf die von Schlegel gegebene gute Farbentafel (Nederl. Tijdschr. voor de Dierk. I, 1863, Pl. I).

Der Leibesgestalt nach sind die Lappenatzeln ¹⁾ kurze, gedrungene, dicke Vögel, die unter der Staarenfamilie mit zu den grössten gehören, und sich durch das einfarbig schwarze Gefieder mit lebhaft purpurviolettem oder stahlgrünem Metalschimmer kennzeichnen, das nur durch einen weissen Flügelspiegel (meist auf den Handschwingen) unterbrochen wird.

Die Form des sehr kräftigen Schnabels ist aus den beigegebenen Abbildungen ersichtlich, welche zugleich die kleinen rundlichen, freistehenden Nasenlöcher zeigen.

Die Flügel sind lang, spitz und decken den Schwanz bis über die Hälfte oder nahezu auf Zweidrittel. Die Flügelspitze ist mässig lang und beträgt meist etwas weniger als $\frac{1}{4}$ der ganzen Flügellänge. Handschwingen sind 10, Armschwingen 8 bis 9 vorhanden (je nachdem man die letzte kleinste mitrechnet, was bei Bälgen und ohne Gefährdung derselben sich ohnehin schwer genau feststellen lässt). Bemerkenswerth für die Flügelbildung ist die Verschmälerung der zweiten Schwinge an der Innenfahne fast von der Mitte an, und die, wie bei allen staarartigen Vögeln, rudimentäre erste Schwinge, welche nur wenig länger ist als die oberen Deckfedern der Handschwingen und wegen ihrer Kleinheit leicht übersehen werden kann. Die Länge der ersten rudimentären Schwinge variiert bei 30 Exemplaren

1) In Indien heissen diese Vögel meist: „Myna, Mino oder Maina“, ein Name der auch auf andere staarartige Vögel der Gattung *Acridotheres* angewendet wird, der malayische Name ist „Tjiong“; „Beo“ ist der Battaname für *G. javanensis*.

von *G. javanensis* von 25—35 mm. und ist bei *G. religiosa* am kleinsten (15—20 mm.).

Ueber das Verhältniss der längsten Schwingen lässt sich kaum eine allgemein gültige Formel aufstellen, da individuell bei ein und derselben Art erhebliche Abweichungen vorkommen, wie dies bei so vielen Vögeln der Fall ist.

Die Untersuchung von 30 *G. javanensis* mit vollkommen entwickelten Schwingen ergab folgende Verhältnisse:

1	Exempl.:	6 ^{te}	Schwinge	die	längste;	5	u.	4	wenig	kürzer,	2=6.
2	"	5	"	"	"	"	"	4	u.	6	"
3	"	3	"	"	"	"	"	2	u.	4	"
5	"	4	"	"	"	"	"	3	u.	5	2=6.
6	"	4	u.	5	"	"	"	3	u.	6	2=7.
5	"	3—5	"	"	"	"	"	2	u.	6	"
8	"	3	u.	4	"	"	"	2	u.	4	"

Die letztere Formel ist daher am häufigsten vertreten, auch bei den übrigen untersuchten Arten: *religiosa*, *venerata* (hier auch 6 u. 3—6), *intermedia*, *ptilogenys*. Bei *G. robusta* fand ich dagegen vorherrschend die 4 u. 5 Schwinge am längsten (3 und 6 kaum kürzer; 2 = 7), bei *G. batuensis* meist die 4^{te}; (3 u. 5^{te} wenig kürzer, 2^{te} = 6^{ten}).

Der Schwanz ist kurz (stets kürzer als die Hälfte der Flügellänge), am Ende gerade oder sehr wenig gerundet und besteht aus 12 breiten, am Ende abgestutzten Federn, die von den breiten Deckfedern mehr als über die Hälfte bedeckt werden.

Die Füße sind sehr kräftig, der Lauf ist ungefähr so lang oder etwas länger als die Mundspalte oder die Mittelzehe mit Nagel und vorn mit sechs Schildern bekleidet; die Zehen sind mit stark gekrümmten scharfen Krallen bewehrt, unter denen die der Hinterzehe am grössten ist.

Die Verbreitung der Lappenatzeln erstreckt sich über Vorder- und Hinterindien nördlich vom Himalaya, südlich bis auf Ceylon, die Andamanen, Nicobaren und Malacca, östlich bis in's westliche China, über die grossen Sunda-

inseln, östlich bis auf die Insel Palawan, südlich auf einige zwischen Java und Timor gelegene Inseln, von denen Alor die südöstlichste Grenze der Verbreitung bildet. (Siehe N^o. 2, *G. venerata*). Auf Timor selbst, Celebes und den Philippinen fehlen Lappenatzeln und sind (mit Ausnahme der ersteren Insel) durch verwandte Gattungen (*Basileornis*, *Sarcops*) vertreten, ebenso auf Neu Guinea und einigen benachbarten Inseln (durch die Gattungen *Mino* und *Melanopyrrhus*).

Bezüglich des Artenwerthes sind, wie fast stets in dieser Wissenschaft, die Ansichten der Forscher sehr verschieden. Schlegel characterisirte 1863 ¹⁾ sieben Arten (da seine *Gracula Dumonti* (Less.) zum Genus *Mino* Less. gehört), Sharpe beschreibt im »Catalogue of the Birds in the British Museum» (vol. XIII, 1890, p. 98—110) 5 Species und 3 Subspecies, ausserdem 4 dem British Museum fehlende Arten, im Ganzen also 12 verschiedene Formen. Seitdem sind zwei weitere hinzugekommen, so dass im Nachfolgenden 14 Arten characterisirt werden, von denen nur 2 meiner autoptischen Untersuchung entgingen.

Ueber Lebensweise, Nestbau (stets in Baumhöhlen) und Eier besitzen wir von den indischen Arten eingehendere Kunde, während über die der Sundainseln nur spärliche Notizen vorliegen. Das Gefangenleben schildert Brehm am besten (»Gefangene Vögel» 2^{te} Band ²⁾), 1876, S. 563 und 564).

1. *Gracula religiosa* L.

Taf. 1, Fig. 1 (Kopf) und 2 (Nackenlappen).

Schleg. Nederl. Tijdschr. v. Dierk. (Amsterdam) I, 1863, p. 3, Pl. I, Fig. 1 (Kopf).

1) »Bijdrage tot de kennis van het geslacht *Beo* (*Gracula*)» in: Nederlandsch Tijdschrift voor de Dierkunde, uitgegeven door het Koninklijk Zoologisch Genootschap Natura Artis Magistra te Amsterdam. Eerste Jaargang, 1863, p. 1—9, Pl. I.

2) Ich habe hier 8 Arten Lappenatzeln beschrieben, die anderen unter »*Eulabes*» beschriebenen 4 Arten gehören verschiedenen Genera an.

Eulabes religiosa Oates, Faun. Brit. Ind. Birds, I, 1889, p. 511 (Kopf).
Mainatus religiosus Sharpe, Cat. B. Br. M. XIII, 1890, p. 99
 (p. 100, Fig. des Kopfes von oben).

Ausgezeichnet durch die Nackenlappen, deren Basis jederseits in einen nackten Hautstreif ausläuft, von denen der untere sich bis zum hinteren Augenrande zieht, während der obere, am Innenrande als gezackter, niedriger Kamm, bis zur Mitte des Hinterkopfes läuft. Die beiden Hautstreifen begrenzen daher an jeder Seite des Hinterkopfes ein länglich hufeisenförmiges Federfeld (s. Fig. 2).

Färbung schwarz mit metallischgrünem Metalschimmer; auf Hinterhals, dem oberen Mantel und der Brust mit purpurviolettem Schein; 2te bis 8te Schwinge mit weissem Spiegel (auf der sechsten bis siebenten 20 bis 25 mm. breit); auf der ersten nur auf der Innenfahne, auf der 7ten oder 8ten meist nur auf der Aussenfahne; ein Exemplar zeigt auf der neunten Schwinge einen kleinen weissen Schaftfleck (M. S. Cat. N^o. 3, Ceylon). — Beide Geschlechter sind in Färbung und Ausdehnung und Form der Nacktheile ganz gleich. Junge düster gefärbt; Nackenlappen sehr klein, fast fehlend.

Kleinste Art:

Al.	culm.
134—142 mm.	21—25 mm.

Süd-Indien und Ceylon. Im Leidener Museum 5 Exemplare, darunter von Ceylon durch Diard (1859).

Ueber Lebens- und Nistweise vergl.: Jerdon, B. of Ind. II, 1863, p. 338. — Legge, Birds of Ceylon, II, 1880, p. 683. — Oates, Fauna of Brit. Ind. Birds, vol. I, p. 509 und 511.

2. *Gracula venerata* (Temm.).

Schleg. Nederl. Tijdschr. v. Dierk. (Amsterdam) I, 1863, p. 4,
 Pl. I, Fig. 2 (Kopf).

Mainatus veneratus Sharpe, Cat. B. Br. M. XIII, 1890, p. 101.

Eulabes veneratus Hartert, Nov. Zool. 1896, p. 568 (Sumbawa),
 id. 1897, p. 522 (Flores) und 1898, p. 457 (Alor und Pantar).

Notes from the Leyden Museum, Vol. XXI.

Schon durch die Färbung von allen übrigen Arten genügend unterschieden; das ganze Gefieder ist nämlich dunkel metallischgrün glänzend und zeigt nur auf der Kehle einen purpurvioletten Schein. Zweite bis 7^{te} oder 8^{te} Schwinge mit weissem Spiegel (auf der zweiten nur auf der Innenfahne, auf der achten meist nur auf der Aussenfahne) der auf der fünften oder sechsten 20—28 mm. breit ist. Zuweilen zeigt die achte Schwinge nur einen kleinen weissen Fleck auf der Aussenfahne; ein Exemplar (M. S. Cat. N^o. 6, Flores) einen solchen auch auf der neunten Schwinge.

Die Anordnung der Nacktheile ist wie bei *G. religiosa* (s. Fig. 1 und 2), indem der nackte Hautstreif, welcher sich bis zur Mitte des Hinterkopfes hinzieht, ebenfalls am Innenrande einen aufrechtstehenden (bis 5 mm. hohen) Kamm bildet, aber die Nackenlappen zeichnen sich durch die bedeutende Grösse aus (bis 25 mm. lang und 30 mm. breit) und stossen an der inneren Basis zuweilen zusammen.

Alte Vögel stimmen in beiden Geschlechtern durchaus überein (auch in der Grösse der Nackenlappen); Junge sind matter gefärbt und besitzen nur ganz kleine Nackenlappen (M. S. Cat. N^o. 2 nur 4 mm. lang) oder dieselben fehlen ganz (Hartert); der weisse Spiegel zeigt dieselbe Ausdehnung als bei alten Vögeln.

Ausehnlich gross:

Al.	culm.
166—172 mm.	31—33 mm.

Inseln zwischen Bali¹⁾ und Timor und zwar bis jetzt auf den folgenden nachgewiesen: Sumbawa (Dr. Forsten 1842, v. Lansberge 1882: Leid. Mus.; Doherty 1896); Flores (Sammelink 1863, Dr. ten Kate 1891: Leid. Mus.; Everett 1897); Pantar und Alor (Everett).

Lebens- und Nistweise noch unbekannt.

1) Hier ist durch Doherty *Gr. javanensis* nachgewiesen worden, der dagegen von Lombok, Satonda und Sumba keine *Gracula* einsandte (s. Novit. Zool. 1896), ebensowenig als Schädler solche von Wetter oder Kisser. Auf Timor sicher fehlend.

3. *Gracula javanensis* (Osbeck) 1757, (nec Hume).

Taf. 1, Fig. 3, 4 (Kopf, alt u. jung), 5—8 (Nackenlappen).

Gracula religiosa Wagl. (nec L.), Syst. av. 1827.*Gracula javanensis* Schleg. Nederl. Tijdschr. v. Dierk. (Amsterdam),

I, 1863, p. 5, Pl. I, Fig. 3 (Kopf ad nat.).

Eulabes intermedia A. Müller (nec A. Hay), Orn. Salanga, 1882, p. 36.*Eulabes javanensis* Oates, Faun. Brit. Ind. Birds, I, p. 512 (Kopf).*Mainatus javanensis* Sharpe, Cat. B. Br. M. XIII, 1890, p. 102 (ohne Subspec. α p. 104).*Eulabes javanensis* (Osbeck) *typicus* Hartert, Nov. Zool. III, 1896, p. 547 (Bali).

Die Nackenlappen sind an der innern Basis (auf der Mitte des Hinterkopfes) meist durch einen schmalen Federstreif geschieden; die seitliche Basis zieht sich als schmaler Hautstreif bis fast zum oberen Augenrande hin.

Die beigegebenen Abbildungen (Fig. 5—7, Taf. 1) werden die erheblichen Abweichungen in der Grösse und Form der Nackenlappen besser zum Verständniss bringen als lange Beschreibungen, indem sie aus einer Reihe von nahezu 50 alten Vögeln unseres Museums, die am meisten abweichenden Exemplare darstellen. Die Länge der Nackenlappen variirt, unabhängig vom Geschlecht, wohl aber nach dem Alter, von 10—26 mm., die Breite von 13—18 mm., zeigt also in den Regel die Form eines mehr langen als breiten Blattes, wie dies Fig. 6 darstellt, die zugleich auch die vorherrschende Grösse zeigt. Der schmale Federstreif, welcher den inneren Basisrand der beiden Nackenlappen trennt, ist meist so schmal wie auf dieser Figur (6), zuweilen aber auch bis 10 mm. breit, also noch breiter als auf Fig. 7. Bei sehr alten Exemplaren berühren sich die Nackenlappen an der inneren Basis zuweilen (von 50 Exemplaren aber nur 15) oder sind hier selbst (ca. 4 mm. lang) miteinander verwachsen (wie Fig. 5), eine Eigenthümlichkeit welche ich aber unter 50 Exemplaren nur an zweien fand.

Der nackte Fleck unter dem Auge variirt ebenfalls er-

hebtlich (s. Fig. 3 und 4) und seine Grösse, wie die Ausdehnung des dazwischenliegenden Federstreifs werden bei Bälgen sehr durch die Art und Weise der Präparation beeinflusst.

In Bezug auf die Ausdehnung des weissen Flügelspiegels ist nach der von mir untersuchten Reihe von 52 Exemplaren das Folgende zu bemerken. In der Regel beschränkt sich der weisse Spiegel auf die 2^{te} bis 7^{te} Schwinge (und zwar auf der zweiten stets nur auf die Innenfahne); 11 Exemplare haben aber auch auf der 8^{ten} Schwinge einen weissen Fleck, der aber nur bei einem Exemplare über beide Fahnen läuft, bei den übrigen dagegen nur auf die Aussenfahne beschränkt bleibt. Ein einziges Exemplar (M. S. Cat. N^o. 20 von Banka) zeigt auch auf der 9^{ten} Schwinge einen kleinen weissen Schaftfleck. Die Breite des weissen Fleckes auf der Aussenfahne der 6^{ten} Schwinge variirt in der Regel von 19—28 mm., nur drei Exemplare (M. S. Cat. N^o. 28, 30 und 34: Padang) zeigen diesen Fleck nur 15—17 mm. breit, während er bei einem Exemplare (M. S. Cat. N^o. 13: Borneo) sich auf 31 mm. ausdehnt.

Im Uebrigen ist die Färbung alter Vögel schwarz mit lebhaft purpurviolettem Metallschein, der auf dem Bürzel, oberen Schwanzdecken, Kopf, Bauch und den unteren Schwanzdecken durch einen dunkel stahlgrünen Metallschein ersetzt wird. Dieser grüne Schein ist zuweilen nur schwach angedeutet und zieht mehr oder minder ins Purpurviolette, ja, drei Exemplare (M. S. Cat. N^o. 7 und 13: Borneo und N^o. 37: Malacca) zeigen auch auf Bürzel und den oberen Schwanzdecken den purpurvioletten Schein fast so lebhaft als auf dem Mantel.

Junge Vögel sind mattschwarz gefärbt, namentlich auf der Unterseite; die Federn auf Kinn und Kehle sind kurz und zeigen hie und da die weisse Basis; der weisse Flügelspiegel ist ebenso breit als bei alten Vögeln. Junge Vögel zeigen zuweilen die äusserste Schnabelspitze dunkelbraun oder bräunlich getrübt und stets rudimentäre (nur 4—5 mm. lange) Nackenlappen, die zuweilen nur eine

Hautfalte bilden (s. Fig. 4). Junge Vögel in dem mattschwarzen Kleide und ohne Nackenlappen zeigen zuweilen die Flügel glänzend schwarz, die Oberseite mit purpurviolettem Scheine oder hie und da bereits einzelne metallischglänzende (neue) Federn. Solche junge Vögel sind meist bereits so gross als alte, welche nach unseren Reihen folgende Grössenunterschiede zeigen:

Al.	culm.				
173—185 mm.	23—30 mm.	alt	Java	6	Exempl.
162 "	26 "	jung	"	1	"
170—188 "	23—28 "	alt	Borneo	14	"
170 "	27 "	jung	"	1	"
176—180 "	25—27 "	alt	Billiton	3	"
176 "	25 "	jung	"	1	"
175—188 "	25—27 "	alt	Banka	7	"
170 "	25 "	jung	"	1	"
168—185 "	24—28 "	alt	Sumatra	12	"
178 "	26 "	jung	"	1	"
162 "	24 "	alt	Salanga	1	"

Das letztere Exemplar von Salanga hat den Flügel auffallend kurz¹⁾, aber drei alte Exemplare von Sumatra sind fast ebenso kurzflügelig (M.S. Cat. N^o. 30: Padang: 163 mm.; N^o. 34: Padang: 165 mm.; N^o. 35: Deli: 163 mm.) und als Ausnahmen zu betrachten.

Die von mir notirten Verschiedenheiten in Färbung, Ausdehnung der Nackenlappen und Grösse sind unabhängig von den Localitäten, von welchen folgende in den Reihen unseres Museums vertreten sind: Java [Ost: Berg Kawi, Passaruan; West: Djassinga (S. Müller 1827), Gadok (Bernstein 1859), Berg Salak u. Preanger (Vorderman 1896)]; Borneo [Süden: Banjermassing (Schwaner 1843), Martapura (Croockewit 1852), Pleyhari (Sammelink 1866)]; Central: Obere Kapuas, Berg Kenepai (Büttikofer 1894); West: Pontianak (Moret 1894); Nord: Baram (Hose 1893)];

1) Dr. Müller notirt für 5 Salanga Exemplare folgende Maasse: al. 150—170; culm. $22\frac{1}{2}$ —27 mm." (Ornis Salanga, p. 39).

Billiton (Vorderman 1896); Banka (v. d. Bossche 1861, Vosmaer 1873); Sumatra [Südost: Palembang (Schuylenburg 1888); Südwest: Indrapura (S. Müller 1835), Padang und Hochlande (Sumatra Expedition 1878, Klaesi 1884); Nordost: Deli (Hagen 1884)]; Insel Salanga, W. Küste von Malacca (Cpt. Weber 1880) und Malacca (Deyrolle, Paris 1867).

Die weitere Verbreitung von *G. javanensis* erstreckt sich über Malacca, Perak, nördlich bis Süd-Tenasserim, südlich bis auf die Insel Bali (Doherty). Durch Vorderman auch auf der kleinen Insel Mendanau, zwischen Banka und Billiton nachgewiesen, aber nicht von den Java naheliegenden Inseln Kangean, Bawean und Noordwachter notirt.

Ueber das Freileben dieser auf den Sunda-Inseln so häufigen Art liegen nur sehr spärliche Beobachtungen vor. Dr. Hagen giebt einige kurze Notizen über Lebens- und Nistweise auf Sumatra ¹⁾, berichtet aber sehr anziehend über das Gefangenleben und hauptsächlich über die Leichtigkeit, mit welcher dieser Vogel menschliche Worte nachzusprechen lernt.

Sehr abweichend ist *Gracula javanensis* M. S. Cat. N^o. 38: altes Männchen (Käfigvogel aus dem Zoolog. Garten in Rotterdam 1881) durch den gänzlichen Mangel von Nackenlappen.

Das Exemplar zeigt nur jederseits am Hinterkopfe einen 8 mm. breiten nackten Hautstreif, der sich, seitlich verschmälert bis nahe zum oberen Augenrande fortsetzt. Auf der Mitte des Hinterkopfes laufen die beiden nackten Hautstreifen ineinander, weil hier die Federn ausgegangen sind. Der nackte Fleck unter dem Auge, wie die Färbung des Gefieders (mit lebhaftem Metallschimmer) stimmen durchaus mit alten Vögeln von *G. javanensis* überein. Der weisse Flügelspiegel bedeckt die zweite bis achte Schwinge

1) „Die Thier- und Pflanzenwelt von Deli, auf der Ostküste Sumatras“ in: „Tijdschr. van het Koninkl. Nederl. aardrijkskundig Genootschap, 1890, p. 153 und 154“ (Separat).

(hier beide Fahnen) und ist auf der sechsten 25 mm. breit.
Al. 176 mm. culm. 24 mm.

Das gänzliche Fehlen von Nackenlappen, die selbst junge *G. javanensis* wenigstens durch eine Hautfalte bereits andeuten, ist bei diesem alten Männchen jedenfalls sehr auffallend, wahrscheinlich aber auf zurückgebliebene Entwicklung in Folge Gefangenschaft von frühester Jugend au zurückzuführen. Wenigstens wage ich es nicht das Exemplar als neue Art einzuführen.

4. *Gracula enganensis* Salvad.

Annal. del Mus. Civ. di Genova, serie 2, vol. XII, 1892, p. 137.

Durchaus wie *G. javanensis*, aber der nackte Hautstreif, welcher die seitliche Basis der Nackenlappen bildet, zieht sich nicht bis zum oberen Rande des Auges und ist durch einen viel breiteren Federstreif von dem schmalen nackten Hautstreif unter dem Auge getrennt.

Die Nacktheile stimmen daher ganz mit denen von *G. robusta* und *G. batuensis* überein (Taf. 2, Fig. 9 und 12), aber die Nackenlappen (16 mm. lang und 18 mm. breit) sind an der Basis nicht miteinander verwachsen, sondern berühren sich nur, wie dies bei *G. javanensis* auch vorkommt.

Der weisse Spiegel findet sich auf der 2^{ten} bis 10^{ten} Schwinge, auf der zweiten nur an der Innenfahne, auf der zehnten nur als Schaffleck auf der Aussenfahne und ist auf der siebenten 30 mm. breit.

Al.	culm.	
175 mm.	25 mm.	♂.
170—180 "	30 "	" (Salvadori 13 Expl.).

Die Art ist also nicht »kleiner als *G. javanensis*«, wie Salvadori angiebt, da manche Exemplare von letzterer Art ganz gleiche Maassverhältnisse besitzen, aber beträchtlich kleiner als *G. robusta* und *G. batuensis*.

Insel Engano, nahe der Südwestküste von Sumatra (Coll. Dr. Modigliani 1891).

Durch gütige Vermittlung meines Freundes Dr. Salvadori erwarb das Reichsmuseum eins der typischen Exemplare (♂ ad.) in Tausch.

5. *Gracula robusta* Salvad.

Taf. 2, Fig. 9 (Kopf), 10 und 11 (Nackenlappen).

Gracula robusta Salvad. Annali del Mus. Civ. di Genova, vol. IV, 1887, p. 554, Tav. IX, fig. 2.

Mainatus intermedius (Hay) Subsp. β *M. robustus* (Salvad.) Sharpe, Cat. B. Br. M. XIII, 1890, p. 109.

Mainatus robustus Oustalet, Bull. de la Soc. philom. de Paris, Tom. IV, N^o. 3, 1892, p. 116. — Büttik. N. L. M. XVIII, 1896, p. 184.

Durch bedeutende Grösse, den breiten weissen Flügel-
spiegel und die weissen Schaftflecke der Armschwingen
leicht kenntlich.

Salvadori hat (l. c.) in Wort und Bild eine so treffliche
Darstellung dieser ausgezeichneten Art gegeben, dass selbst
der Mangel an Exemplaren kaum zu entschuldigen vermag
wenn Sharpe dieselbe nur als eine Subspecies, und noch
dazu von *G. intermedia* Hay, betrachten zu müssen glaubte,
ein Irrthum der durch Oustalet (l. c.) bereits genügend
klargestellt wurde. Nach sechs mir vorliegenden Exemplaren
von Nias (Coll. Kannegieter 1895, s. Büttik. l. c.) kann
ich die von den beiden genannten Forschern angegebenen
Artenkennzeichen nur bestätigen.

Unter allen *Gracula*-Arten ist diese am grössten:

Al.	culm.
200—213 mm.	31—34 mm.

Die Nackenlappen sind breiter als lang, wie Fig. 10 und
11 (Taf. 2) zeigen, und zwar den grössten und kleinsten zweier
alten Weibchen (M. S. Cat. N^o. 2 und 3), welche übrigens
in Grösse und Form ganz mit solchen von Männchen über-
einstimmen. Bei zwei Exemplaren setzt sich die Befiederung

der Mittellinie des Kopfes bis auf den Nackenlappen fort, wodurch es den Anschein gewinnt als seien die Nackenlappen durch einen Federstreif getrennt (wie bei *G. javanensis*). Eine genauere Untersuchung überzeugt aber bald, dass die Nackenlappen an der Basis stets verwachsen sind, wie dies auch die Figur im Hintergrunde (auf Tav. IX bei Salvadori) zeigt. Die seitliche Basis der in einen schmalen Hautstreif auslaufenden Nackenlappen zieht sich nicht wie bei *G. javanensis* bis zur Höhe des hinteren Augenrandes, sondern nur bis oberhalb der Ohrgegend. Bei unseren Exemplaren läuft die seitliche Basis der Nackenlappen übrigens nicht nahezu mit dem nackten Flecke unter den Augen zusammen, wie dies Salvadori's Abbildung zeigt, sondern ist durch einen Federstreif getrennt (s. Fig. 9), was mit von der Präparation der Bälge herrühren mag.

Der weisse Spiegel der Handschwinge zieht sich (mit Ausnahme der ersten rudimentären) über sämtliche zehn, und ist auf der 7^{ten} oder 8^{ten} am breitesten (54—64 mm.); auf der zweiten Schwinge ist das Weiss meist nur auf die Innenfahne beschränkt, zieht sich bei zwei Exemplaren aber auch auf die Aussenfahne. Die Armschwinge zeigen (mit Ausnahme der zwei oder drei letzten) auf der Mitte einen mehr oder minder ausgedehnten, meist schmalen, länglichen weissen Schaftfleck, wie dies die verkleinerte Figur eines Exemplares mit ausgebreiteten Flügeln auf Salvadori's Tafel gut darstellt. Nur bei einem alten Männchen (M. S. Cat. N^o. 1) sind die weissen Schaftflecke auf die drei ersten Schwinge zweiter Ordnung beschränkt.

Die Färbung stimmt genau mit der von *G. javanensis* überein und zeigt denselben lebhaft purpurvioletten Schein auf Mantel und Schultern (der auf Tav. IX von Salvadori unrichtig in Grün wiedergegeben ist). Zu erwähnen wäre noch, dass vier unserer alten Vögel auf den Federn der Bauchmitte sehr schmale graulich verwaschene Endsäume zeigen.

Das Jugendkleid ist noch unbeschrieben, dürfte aber nach Analogie der verwandten Arten nur die bekannten

Unterschiede (matte fast glanzlose Färbung und wenig oder kaum entwickelte Nackenlappen) aufweisen.

Insel Nias (an der Nordwestküste von Sumatra).

6. *Gracula batuensis*, n. sp.

Taf. 2, Fig. 12 (Kopf), 13 und 14 (Nackenlappen).

Durchaus mit *G. robusta* übereinstimmend, aber kleiner, der weisse Flügelspiegel minder breit und die Armschwingen ohne weissen Schaftfleck.

Die Nackenlappen stimmen in Form und Grösse ganz mit denen von *G. robusta* überein, sind wie bei dieser Art mehr breit als lang und an der Basis mit einander verwachsen, übrigens bei beiden Geschlechtern ganz gleich. Ein altes Männchen (Fig. 14) besitzt die kleinsten Nackenlappen, ein anderes Männchen hat dieselben fast so gross als das alte Weibchen (Fig. 13). Der seitliche Basisstreif der Nackenlappen ist bei einem Exemplare länger als dies Fig. 12 zeigt und zieht sich fast bis zum oberen Augenspiegel, also fast ganz wie bei *G. javanensis*. Der weisse Spiegel zielt die 2^{te} bis 8^{te} Schwinge, zieht sich bei einem Exemplare auch auf die Aussenfahne der 9^{ten} und ist auf der 6^{ten} und 7^{ten} am breitesten (29—36 mm.).

Al. culm.

190—195 mm. 29—32 mm. ♂ und ♀ (4 Expl.).

Die Färbung ist genau dieselbe wie bei *G. robusta* und *javanensis*, mit welcher letzteren Art *G. batuensis* auch durch die einfarbig schwarzen Schwingen zweiter Ordnung am meisten übereinstimmt. Aber selbst das kleinste Exemplar von *G. batuensis*, mit dem schmalsten Spiegelfleck, welches sich dadurch gewissen Exemplaren von *G. javanensis* ausserordentlich nähert, unterscheidet sich noch immer leicht durch die Form der Nackenlappen.

Beide Geschlechter sind ganz gleich, auch in der Färbung der Nacktheile. »Iris hellgrau bis braungrau, Schnabel orangefarben, Füsse gelb'' Kannegieter. — Junge Vögel liegen nicht vor.

Ein altes Weibchen zeigt eine sonderbare Deformität des Schnabels: die Spitze des Unterschnabels überragt rechts den Oberschnabel, bildet also eine Art Kreuzschnabel.

Batu-Inseln (Pulu Tello), an der Nordwestküste von Sumatra, etwas südlich von Nias.

Es liegen vier alte Exemplare vor, welche im October und November 1896 von J. Z. Kannegieter, dem eifrigen Reisenden und Sammler des Herrn J. R. H. Neervoort van de Poll gesammelt wurden.

7. *Gracula palawanensis* (Sharpe).

Mainatus javanensis (Osb.) Subspec. α *M. palawanensis* Sharpe, Cat. B. Br. M. XIII, 1890, p. 104. — Whitehead, Explor. of Mt. Kina Balu (Lond.) 1893, p. 256 (Palawan).

Eulabes palawanensis Everett, Ibis 1895, p. 27 (Palawan).

Wie *G. javanensis*, aber Hinterhals und Oberrücken mit grünem Metallscheine, ebenso die Endsäume der oberen Flügeldecken und nur der hintere Mantel in's Purpurviolette scheinend, wodurch nur eine purpurviolette Querbinde über den hinteren Mantel entsteht; (bei *G. javanensis* sind der ganze Hinterhals, Mantel, nebst oberen Flügeldecken purpurviolett); die Unterseite ist metallisch schwarzgrün, ohne den lebhaft purpurvioletten Schein auf der Brust, wie ihn alle Exemplare von *G. javanensis* so deutlich zeigen. Der weisse Flügelspiegel ist wie bei *G. javanensis* (2^{te}—8^{te} Schwinge, auf der sechsten 20 mm. breit). Die Vertheilung der Nacktheile weicht, nach dem einen Exemplare unseres Museums zu urtheilen (altes ♀, Coll. Dr. Platen 1877), insofern von *G. javanensis* ab, als der seitliche Basishautstreif der Nackenlappen sich bis zum hinteren Augenraude hinzieht. Die Nackenlappen selbst sind mässig gross (ca. 12 mm. lang und ebenso breit), im übrigen ganz wie bei *G. javanensis*, an der Basis durch einen sehr schmalen Hautstreif verbunden, wie dies bei gewissen Exemplaren von *javanensis* auch der Fall ist (vergl. Fig. 5).

Auf die geringere Grösse ist schon von Sharpe als unter-

scheidendes Kennzeichen hingewiesen worden, ebenso von Oustalet (Bull. de la Soc. philomat. Paris, IV, 1892, p. 116).

Al.	culm.
153 mm.	22 mm.

Palawan (und dieser Insel eigenthümlich; vergl. Whitehead und Everett l. c.).

8. *Gracula andamanensis* (Tytler).

Taf. 2, Fig. 16 (Kopf).

Eulabes andamanensis (Tytler) Beavan, Ibis 1867, p. 331.

Mainatus intermedius (Hay) Subspec. α *Mainatus andamanensis* (Beavan) Sharpe, Cat. B. Br. M. XIII, 1890, p. 107.

Die Art fehlt unserem Museum, ich untersuchte aber Exemplare von den Nicobaren (Wiener Museum) und Andamanen (Port Blair: Museum Turati) und verglich dieselben mit Exemplaren von *Gr. intermedia* von Burma und *Gr. javanensis* von Java. Nach meinen Aufzeichnungen unterscheidet sich *Gr. andamanensis* schon dadurch, dass der nackte Fleck unter dem Auge durch einen Federstreif von der nackten Basis der Nackenlappen getrennt ist (vergl. Fig. 16 und 15), und stimmt daher in diesem Character zunächst mit *Gr. javanensis* überein. Die Nackenlappen (15—17 mm. lang) sind so gross als bei letzterer Art, scheinen also grösser als bei *Gr. intermedia*, wie die Dimensionen im Allgemeinen; dagegen ist die Färbung, wie die Ausdehnung des weissen Flügelspiegels (auf der 2^{ten} bis 7^{ten} Schwinge ¹⁾) ganz so wie bei *Gr. intermedia*. Beide Geschlechter sind durchaus gleich.

Al.	culm.
160—168 mm.	26 mm.

Lord Tweeddale erklärt *Gr. andamanensis* für eine von *Gr. intermedia* verschiedene Art (s. Ibis 1871, p. 177 und

1) Nach Sharpe bisweilen 2^{te} bis 5^{te}; ein Exemplar zeigt sogar 12 weisse Flügelflecke, also auch die zwei ersten Armschwingen weissgefleckt.

1873, p. 313); Sharpe nur für eine »stout-billed race'' von *Gr. intermedia*. Hume findet ebenfalls »perfectly constant characters'' (s. Stray-feathers 1878, p. 398 »*Eulabes javanensis*, from Andamaus and Nicobars'', und ib. 1874, p. 254).

Andamanen und Nicobaren.

Ueber Lebens- und Nistweise berichtet Tytler (*Eulabes javanensis*, Stray-Feathers, 1874, p. 255 und 256).

9. *Gracula intermedia* (A. Hay) 1844.

Taf. 2, Fig. 15 (Kopf).

Schleg. Nederl. Tijdschr. v. Dierk. (Amsterdam) I, 1863, p. 6, Pl. I, Fig. 4 (Kopf ad nat.).

Eulabes javanensis Hume (nec Osb.), Stray Feathers, 1874, p. 254; 1875, p. 152; 1876, p. 335; 1877, p. 86; 1879, p. 106.

Eulabes intermedia Oates, Faun. Brit. Ind. Birds, I, 1889, p. 511 (Kopf).

Mainatus intermedius Sharpe (nec A. Müll.), Cat. B. Brit. Mus. XIII, 1890, p. 104 (ohne Subspec. α p. 107 und β p. 109).

Dadurch ausgezeichnet, dass der nackte Fleck unter dem Auge durch einen nackten Streif mit dem nackten Fleck der Schläfe (welcher die seitlichen Basis der Nackenlappen bildet) verbunden ist, der schmale Federmittelstreif¹⁾ also nicht durchläuft (s. Fig. 15 und die von Schlegel gegebene Abbildung, jedenfalls nach einem jüngeren Exemplare, mit wenig entwickelten Nackenlappen).

Im Uebrigen in der Färbung ganz wie *Gr. javanensis*, ebenso die weisse Zeichnung der Schwingen (2^{te} bis 7^{te} oder 8^{te} Schwinge mit weissem Spiegel, der auf der sechsten 15—25 mm. breit ist. Beide Geschlechter sind ganz gleich; ein jüngerer Vogel (M. S. Cat. N^o. 2 von Nepal) zeigt noch wenig Metallschimmer, namentlich ist die Unterseite nur mattschwarz; die Nackenlappen sind rudimentär (nur 5 mm.

1) »The little patch of feathers, which extends from the hinder part of the eye is triangular in shape, and never reaches to the auricular feathers, leaving always a distinct line of bare skin'' Sharpe l. c. p. 105.

lang, ganz ähnlich wie auf der Abbildung bei Schlegel¹⁾ l. c.); bei alten Vögeln bis 12 mm. lang.

Die Grössenverhältnisse scheinen im Allgemeinen etwas geringer als bei *G. javanensis*.

Al.	culm.
158—166 mm.	23—25 mm.

Central Indien (Himalaya, Burma, Tenasserim, Norden von Malacca, östlich bis Cochinchina). Im Leidener Museum aus Central Indien und Nepal (Hodgson).

Ueber Lebensweise und Brutgeschäft dieser Art liegen mit die ausführlichsten Mittheilungen vor. (s. *Eulabes javanensis* Bingham, Stray-Feathers, 1877, p. 86 (Burma); id. 1880, p. 192 (Tenasserim), id. 1888, p. 268; Oates, Faun. Brit. Ind. Birds, I, 1889, p. 513; id. *Eulabes intermedia*, p. 512).

10. *Gracula ptilogenys* Blyth (1846).

Schleg. Nederl. Tijdschr. v. Dierk. (Amsterdam), I, 1863, p. 7, Pl. I, Fig. 7 (Kopf).

Eulabes ptilogenys Legge, B. Ceylon, II, 1879, p. 685, Pl. XXIX.

Oates, Faun. Brit. Ind. Birds, 1889, I, p. 513 (Kopf).

Mainatus ptilogenys Sharpe, Cat. B. Br. M. XIII, 1890, p. 109.

Die einzige Art mit befiederten Kopfseiten und daran, wie an der schwarzen Basishälfte des Unterschnabels, leicht kenntlich.

Basis des Oberschnabels bis zu den Nasenlöchern ebenfalls schwarz.

Zwei, in der Mitte getrennte, ziemlich grosse Nackenlappen (13—15 mm. lang und ca. 10 mm. breit). Färbung vorherrschend purpurviolett; auf Hinterrücken, Bürzel, oberen Schwanzdecken, Mitte der Unterbrust und übrigen Unterseite mit tief stahlgrünem Scheine; 2^{te}—7^{te} oder 8^{te} Schwinge mit weissem Spiegel (auf der fünften oder sechsten 15—17

1) Schlegel giebt die sehr kleinen Nackenlappen (7 mm.) mit als Artcharacter an, hatte aber damals keinen alten Vogel zum Vergleich.

mm. breit), auf der zweiten nur auf der Innenfahne, auf der 7^{ten} oder 8^{ten} nur auf der Aussenfahne.

Al. 145 mm.; culm. 22—23 mm.

Ceylon (vorzugsweis in den Bergen).

Ueber Lebensweise und Brutgeschäft geben Legge und Oates (l. c.) ausgezeichnete Nachrichten.

11. *Gracula Lidthii* Schleg.

Nederl. Tijdschr. voor Dierkunde (Amsterdam), I, 1863, p. 7, Pl. I, Fig. 6, Kopf (s. n. *G. dubia*¹⁾).

Mainatus lidthi Sharpe, Cat. B. Br. M. XIII, 1890, p. 104 (Note).

Ganz wie *G. javanensis*, aber nur die zweite bis vierte Schwinge mit weissem Spiegelfleck und statt der Nackenlappen nur ein schmaler (ca. 3 mm. breiter) Hautrand.

Das typische Exemplar, noch immer Unicum unseres Museums geblieben, wurde im Jahre 1857 aus der damals berühmten Sammlung des Professors van Lidth de Jeude in Utrecht erworben und stammt wahrscheinlich, wie Schlegel vermuthet, aus der noch älteren Sammlung des Baron van de Capelle her. Jedenfalls rührt das Exemplar, nach der Ausstopferei und der Art der Glasaugen zu urtheilen, aus einer sehr alten Sammlung her und war in Gefangenschaft gehalten worden, wie die gestutzten Schwingen zeigen. Ich würde nicht anstehen das Exemplar für einen alten Vogel von *G. javanensis* mit künstlich verstümmelten (abgeschnittenen) Nackenlappen zu halten, widerspräche dem nicht die weisse Zeichnung der Schwinge. Dieser Spiegel ist auf der zweiten Schwinge, wie bei *javanensis*, auf die Innenfahne beschränkt, und läuft auf der dritten und vierten über beide Fahnen, auf der Aussenfahne nur 7 resp. 10 mm. breit, auf der Innenfahne viel weiter ausgedehnt, ganz so wie dies bei *G. javanensis* auch der Fall ist. Aber bei

1) Die Namen sind auf der Tafel verwechselt (und auch im Text falsch citirt): Fig. 5 ist *dubia* und nicht „*Lidthii*“ und Fig. 6 *Lidthii* und nicht „*dubia*“ wie die Unterschriften irrthümlich angeben.

letzterer Art besitzen die zweite bis siebente oder achte Schwinge einen weissen Spiegel. Die Grösse stimmt ganz mit der von *G. javanensis* überein; der Schnabel erscheint etwas mehr gestreckt; Länge der Firste 28 mm., die der Mundspalte 37; die Schnabelhöhe an der Basis 15 mm. (s. Schleg. Pl. I, Fig. 6, s. n. »*G. dubia*«).

Heimat unbekannt.

12. *Gracula dubia* Schleg.

Nederl. Tijdschr. voor Dierkunde (Amsterdam), I, 1863, p. 7,
Pl. I, Fig. 5, Kopf (s. n. *G. Lidthii*).

Mainatus dubius Sharpe, Cat. B. Br. M. XIII, 1890, p. 104 (Note).

Ganz wie *G. javanensis*, aber ohne weissen Flügelspiegel.

Von letzterem sind wenigstens nur unregelmässige Andeutungen vorhanden: die siebente Schwinge des rechten Flügels zeigt auf der Aussenfahne drei sägezahnförmige weisse Randflecke, die achte eine ca. 3 mm. breite weisse Binde auf der Aussenfahne, die den Rand 25 mm. lang säumt; auf dem linken Flügel zeigt die sechste Schwinge einen kaum bemerkbaren weissen Randsaum an der Aussenfahne, die siebente hier zwei kleine sägezahnförmige Randflecke, dagegen die zweite an der Innenfahne einen weissen Basisfleck von derselben Ausdehnung als bei *G. javanensis*. Mit Ausnahme dieses weissen Basisfleckes ist die Unterseite der Schwingen einfarbig rauchschwarz. Die Nackenlappen sind sehr klein, und bilden nur eine ca. 4 mm. breite Hautfalte, wie bei manchen jungen Vögeln von *G. javanensis* (z. B. M.S. Cat. N^o. 31), aber das Exemplar ist ohne Zweifel ein alter Vogel und zeigt genau denselben lebhaften Metallschein und in denselben Farbentönen als *G. javanensis*. Es ist also keinesfalls eine junge *G. intermedia*, wie sich Sharpe vermuthungsweise ausspricht.

Mit Rücksicht auf die ungleiche weisse Fleckenzeichnung der Schwingen ist *G. dubia* wahrscheinlich am richtigsten als eine zufällige Varietät von *G. javanensis* zu deuten, mit welcher Art auch die Ausdehnung und Vertheilung

der Nacktheile an den Kopfseiten, wie die Grösse übereinstimmen.

Al.	culm.	riect.	alt.
176 mm.	23 mm.	32 mm.	14 mm.

Das typische Exemplar, ein Unicum des Leidener Museum, wurde demselben 1859 durch J. A. Frank, dem früher so bekannten Amsterdamer Naturalienhändler, geschenkt.

Heimat unbekannt.

Die folgenden zwei Arten sind mir nicht aus Autopsie bekannt:

13. *Gracula sinensis* (Swinh.).

Eulabes sinensis Swinh. Ibis, 1870, p. 353. — David et Oust. Ois. de la Chine, 1877, p. 365.

Mainatus sinensis Sharpe, Cat. B. Br. M. XIII, 1890, p. 105 (Note).

»Le Mainate de Chine rapproche beaucoup de l'*Eulabes intermedius* (A. Hay) de l'Inde et de l'Indo-Chine, mais s'en distingue par ses proportions un peu plus faibles, ses caroncules plus étroites, et par la forme de l'espace dénudé au-dessous de l'oeil, espace qui se termine carrément et mesure environs 2 centimètres de large". (David et Oust. l. c. p. 366).

Südwest-China (nördlich bis in die Provinz Kiangsi).

14. *Gracula hainana* (Swinh.).

Eulabes hainanus Swinh. Ibis, 1870, p. 352.

Mainatus hainanus Sharpe, Cat. B. Br. M. XIII, 1890, p. 105 (Note).

»Similar to *Eulabes sinensis*, but having the subocular fleshy skin narrow, 0.25 inch, lengthened downwards and not square" (Swinhoe l. c.).

Insel Hainan.

Das einzige Exemplar, welches Swinhoe lebend besass ging verloren; seitdem nicht mehr zur Untersuchung gelangt.

Leidener Museum, 16 December 1898.

TAFEL-ERKLÄRUNG.

Die Figuren der Köpfe (im Profil) und der Nackenlappen (von oben gesehen) sind (mit Ausnahme von Fig. 16) in natürlicher Grösse gezeichnet und zeigen die charakteristischen Verschiedenheiten der Nacktheile in eingetrocknetem Zustande.

Tafel 1.

- Fig. 1. *Gracula religiosa* (L.). ♂ ad. S. Indien.
(M. S. Cat. N^o. 4).
 „ 2. Nackenlappen desselben Exempl. (*a*: aufrechtstehend).
 „ 3. *Gracula javanensis* (Osb.). ♂ ad. Centr. Borneo.
(M. S. Cat. N^o. 11).
 „ 4. „ „ jung. W. Java. („ „ 6).
 „ 5. Nackenlappen (sehr grosse) von Fig. 3. (*a*: Hautfalte).
 „ 6. „ (gewöhnliche Grösse).
 „ „ ♂ ad. Borneo. (M. S. Cat. N^o. 7).
 „ 7. „ (klein) alter Vogel, Sumatra. („ „ 27).
 „ 8. Hautfalten des jungen Vogels Fig. 4.

Tafel 2.

- Fig. 9. *Gracula robusta* Salvad. ♀ ad. Nias. (M.S. Cat. N^o. 2).
 „ 10. Nackenlappen (grösste) desselben Exemplares.
 „ 11. „ (kleinste). ♀ ad. (M. S. Cat. N^o. 3).
 „ 12. *Gracula batuensis* Finsch. ♀ ad. Batu Ins.
 „ 13. Nackenlappen (grösste) desselben Exemplares.
 „ 14. „ (kleinste). ♂ ad.
 „ 15. *Gracula intermedia* Hay. Ad. Indien. (M.S.Cat. N^o.1).
 „ 16. „ *andamanensis* Tytl. ♂ ad. Andamanen (ca.
 $\frac{2}{3}$ n. Gr.).

NOTE II.

UEBER DIE ARTEN
DER GATTUNG THERISTICUS WAGL.

VON

Dr. O. FINSCH.

Dr. Sharpe unterscheidet im Cataloge des British Museum (Vol. XXVI, 1898, p. 21—23) nur zwei hierher gehörige Arten (*Th. melanopsis* und *Th. caudatus*), indem er *Th. Branickii* Berlepsch als jungen Vogel mit ersterer Art vereinigt. Nach sorgfältiger Vergleichung des Materials in unserem Museum kann ich mich diesem Vorgange nicht anschliessen, sondern halte *Th. Branickii* für eine ausgezeichnete Art, der ich noch eine neue Art hinzuzufügen habe:

Theristicus columbianus, sp. n.

Ibis melanopsis Schl. in Mus. Lugd.

Diagnose: wie *Th. caudatus* vom Kropfe an einfarbig schieferschwarz, aber die Schwingendecken und die verdeckte Basis der Armschwingen nicht weiss wie bei *caudatus*, sondern grau (wie bei *melanopsis*).

Rücken, Schultern und die kleinen oberen Flügeldecken am Unterarm sind braun, mit grünem Metallschein und kaum bemerkbaren helleren Endsäumen, die nur auf den kleinen oberen Flügeldecken deutlicher hervortreten. Kopf und Hals sind schmutzig rostgelblich, die etwas schopfartig

verlängerten Federn des Hinterkopfes dunkler, rostbräunlich. Kinn und Kehle sind befiedert und nur jederseits an der Basis des Unterschnabels zieht sich ein (ca. 20 mm. langer) nackter Streif herab.

Das Exemplar ist unzweifelhaft ein altausgefärbter Vogel den das Reichs-Museum 1867 von Deyrolle in Paris kaufte, mit der Angabe »Columbie'', leider ohne Angabe des näheren Fundortes und Sammlers.

Wie es scheint ist bisher noch keine Art dieser *Ibis*-Gattung in diesem Theile Süd-Americas nachgewiesen.

Theristicus caudatus (Bodd.).

Sharpe, Cat. Br. M. XXVI, p. 23.

Ibis melanopsis (pt.) Schl. Cat. 1863, p. 7 (Nos. 3 u. 4).

Das Reichs-Museum besitzt davon zwei Exemplare, wovon das eine (M.S. Cat. N^o. 1 = Schl. N^o. 4) noch aus dem alten Cabinet Temminck her stammt und hier als »*Tantalus albicollis* Lath.'' bezeichnet war (Temminck: »Catal. syst. 1807, p. 168 N^o. 770), angeblich von »Cayenne''. Das Exemplar ist keineswegs »au plumage imparfait'' (Schlegel) sondern altausgefärbt und zeichnet sich vor allem durch das tiefe Rostbraun auf Kropfmitte, Ober- u. Hinterkopf aus, der übrige Hals ist dunkel rostgelb. Die Oberseite ist dunkel graubraun mit wenig hervortretenden helleren Federenden. Kinn und Kehle sind nackt, mit einem schmalen Federstreif längs der Mitte, der aber nicht durchgeht.

Das andere Exemplar (M.S. Cat. N^o. 2 = Schl. N^o. 3) ist ein altes Weibchen und wurde am 21 Januar 1826 bei Caicara im Innern der Provinz Matto Grosso von Joh. Natterer¹⁾ gesammelt. Es stimmt ganz mit dem alten Vogel (N^o. 1) überein, ist aber im Ganzen heller gefärbt, das Rostbraun auf dem Oberkopfe ist blasser und fehlt auf dem

1) »*Geronticus albicollis* (Gml.) Pelz. Orn. Bras. 1871, p. 307'', von Sharpe (Cat. Br. M. p. 22) irrthümlich zu *Th. melanopsis* gezogen.

Kropfe fast ganz, der Hals ist rostgelblichweiss. Der Federstreif längs der Kinn- u. Kehlmittle zieht sich ganz durch, so dass die Nacktheit dieser Theile in zwei Hälften getrennt wird.

Theristicus melanopsis (Gml.).

Sharpe, Cat. Br. M. XXVI, p. 21 (pt.).

Ibis melanopsis (pt.) Schl. Cat. 1863, p. 7 (Nos. 1 u. 2).

Das Reichs-Museum besitzt vier alte Vögel und ein noch kaum mit Federstoppeln bekleidetes Nestjunges, sämmtlich aus Chile. Cat. N^o. 1 und 2 (♂ und ♀ ad.) stammen nach Temmincks Angabe von d'Orbigny's Reise her, N^o. 3 und 4 (ebenfalls ♂ und ♀ ad.) sind im Juni 1863 bei Santiago durch Philippi gesammelt und durch diesen an das Museum gelangt, wie das Nestjunge (N^o. 5: November 1862). Die alten Vögel haben sämmtlich den Ober- und Hinterkopfleibhaft rostgelbbraun, mehr oder minder von dieser Färbung auch Hinterhals, Halsseiten und zum Theil die Brust, der übrige Hals, Kropf und Brust und von hier verschmälert bis auf die Bauchmitte herab sind hell rostgelblich gefärbt; über die Mitte der Brust zieht sich ein schmales, zuweilen auf der Mitte unterbrochenes graues Querband. Die Exemplare N^o. 1 und 2 haben Kinn und Oberkehle ausgedehnt nackt, mit einem schmalen befiederten Mittelstreif, der sich aber nur bis über das Kinn herabzieht (ganz wie das Nestjunge N^o. 5), während bei N^o. 3 und 4 der Federstreif durchläuft und die Nacktheit in zwei Hälften trennt.

Theristicus Branickii Berl. & Stolzmann.

Ibis, 1894, p. 404.

Th. melanopsis (pt.) Sharpe, Cat. Br. M. XXVI, p. 22 (young: Beschr. u. p. 23 Indiv. g [♂♀ juv. Pitumarca, Peru, April 8 (H. Whately)]).

Die beiden Exemplare unseres Museums (♂ und ♀, M.S. Cat. N^o. 1 und 2) wurden am 8 April 1869 von H. Whately

bei Pitumarca in Peru erlegt und sind jedenfalls alte Vögel. Sie unterscheiden sich auf den ersten Blick durch den ansehnlich kürzeren und schwächeren Schnabel, sowie die helle Färbung von Kopf, Hals und Brust. Nur der Ober- und Hinterkopf, sowie die unteren Halsseiten und die Kropfmitte sind rostgelblich, der übrige Hals und die Brust sind fast rein weiss und dieses Weiss bedeckt auch die ganze Bauchmitte und zieht sich bis auf den After. Der graue Ton der Oberseite stimmt ganz mit *Th. melanopsis* überein, aber die Schwingendecken sind nicht lichtgrau, sondern dunkelgrau und kaum heller als der Oberflügel.

Nachfolgend gebe ich die vergleichenden Messungen und einen sogenannten Schlüssel mit den diagnostischen Artenkennzeichen.

Al.	caud.	culm.	tars.			
400 mm.	195 mm.	138 mm.	80 mm.	<i>caudatus</i> .	Ad.	Cayenne (N ^o . 1).
385 "	205 "	150 "	80 "	"	♀	Matto Grosso (" 2).
415 "	200 "	145 "	80 "	<i>columbianus</i> .	Ad.	
420 "	185 "	160 "	82 "	<i>melanopsis</i>	♂	Chile (N ^o . 1).
385 "	176 "	135 "	73 "	"	♀	" (" 2).
385 "	190 "	143 "	80 "	"	♂	" (" 3).
380 "	192 "	135 "	75 "	"	♀	" (" 4).
390 "	190 "	110 "	65 "	<i>Branickii</i>	♂	Peru (" 1).
380 "	180 "	110 "	63 "	"	♀	" (" 2).

ARTENKENNZEICHEN :

a. *Unterseite vom Kropfe an schieferswarz.*

caudatus: Schwingendecken weiss, wie die verdeckte Basis der Armschwingen.

columbianus: Schwingendecken grau, wie die verdeckte Basis der Armschwingen.

b. *Brust und Bauchmitte weiss; Armschwingen bis zur Basis schwarz.*

melanopsis: Schwingendecken lichtgrau.

Branickii: » dunkelgrau; Schnabel kürzer und schlanker.

Leidener Museum, 13 Juni 1899.

NOTE III.

DESCRIPTIONS OF EARTHWORMS

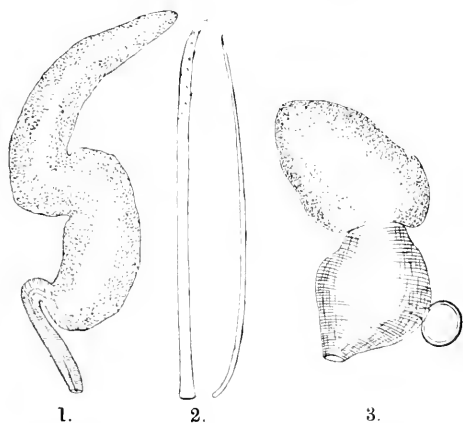
BY

Dr. R. HORST.

X.

ON A BENHAMIA-SPECIES FROM PARAMARIBO.

Among a lot of worms, collected in Paramaribo¹⁾, I met with a dozen of small *Benhamia*-specimens, which cannot



1.

2.

3.

Fig. 1. Prostata. Fig. 2. Penial setae. Fig. 3. Spermatheca.

Oligochaeta⁴⁾ added four new species from Mexico and California. In this

be identified with one of the species of this genus, described from America. The number of these species however is not very large. Rosa described a couple of them from Mexico²⁾ and Paragay³⁾, and Eisen in a recent paper on Pacific Coast

1) See Notes from the Leyden Museum, Vol. XX, 1898, p. 202. The specimens of *Pontoscolex corethrurus*, mentioned in this paper, probably belong to Eisen's variety *mexicanus* (Festschrift für Liljeborg, 1896, p. 8), for they differ from the East-India specimens by having not 130 or more segments from head to caudal zone, but only 103 to 120.

2) Ann. K. K. Naturh. Hofmuseums, Bd. VI, 1891, p. 394.

3) Mem. Accad. reale del Sc. di Torino (II) XLV, 1894—95, p. 137, fig. 13.

4) Mem. California Acad. of Sc. Vol. II, 1896, p. 123.

plentifully illustrated memoir he not only published detailed descriptions and figures of his new species, but also of several other allied forms, making thus comparison of the different American species very easy. Though Eisen's discovery of *Benhamia*-species at Miraflores »in a locality to which plants of any kind have rarely if ever been introduced directly from foreign country" would indicate that they must be considered as truly endemic, I nevertheless thought it desirable to compare our worms also with the African species, 1°. because there exists a close connection between the fauna's of West-Africa and West-India, 2°. because, Paramaribo being a sea-port, our species could have been imported by man's interference, like in many other parts of the world. Thanks the investigations of Michaelsen we know about twenty species of *Benhamia* from Africa, whose body-length does not exceed 75 mm. ; on comparing them with our worms, *B. pallida*¹⁾ from Togo, appears to be the only species, that shows some resemblance with them, especially in the feature of the penial setae. Unfortunately the description of this species is rather incomplete, being based on a single indifferently preserved individual.

Our specimens attain a length of no more than 50 mm. ; the breadth of the body in the clitellar region is about 3 mm. The number of segments of a large specimen is 133. The colour of the body is greenish, only the clitellum and setal areae are whitish. The intersegmental groove between the first and second segment is rather indistinct. The cephalic lobe extends with a roundish prolongation till the half of the buccal segment. The segments behind the clitellum show a circular ridge in the middle, upon which the setae are situated ; the distance between the ventral pairs of setae is a little larger than that between the ventral and dorsal ones. Clitellum saddle-shaped, occupying segments XIII—XX, the anterior and

1) Archiv f. Naturgesch. 1892, p. 50, textfig. B 1 and 2.

the posterior of them only partly glandular; the prostates-pores upon segments XVII and XIX, on an elevated, elliptical area, connected by a groove, that on segment XVIII is faintly curved towards the median line. The oviducal pores separate, hardly visible, at the mesial side of the ventral setae, a little more anteriorly. First dorsal pore in the intersegmental groove III/IV. The spermathecal pores in the groove between segments VII and VIII, VIII and IX, in the series of the ventral setae, connected by a glandular ridge.

The penial sac contains two setae of different shape, but of about the same length (0.6 mm.). The larger of them is 0.014 mm. thick, slightly curved over the fourth distal part of its length and furnished with several distant tubercles; the other seta is much more slender, quite plain, ending abruptly in a fine apex like in *B. culminis* Mich. Each prostata consists of a rather large, linguiform gland, with a knee-shaped bend in the middle, and opening unto the exterior by a curved, much thinner, muscular duct. Each spermatheca is a pyriform pouch separated by a constricted part from the wide, globular duct, which is about equal in size; the latter bears in its middle a small spherical diverticulum, furnished with a short duct. In different individuals however the shape of the spermathecae is somewhat variable, sometimes it is more elongated, resembling those of *B. palmicola*¹⁾. The 11th, 12th and 13th septa are specially thickened. The buccal cavity is usually everted; the two gizzards lie in segment IX. There are three pairs of calciferous glands in segments XV—XVII; only the two anterior ones contain lime crystals.

In the segments behind the clitellum the nephridia are arranged in five rows on either side of the median line, the first of them between the ventral and dorsal rows of setae.

As already stated above, our specimens most resemble

Eisen: loc. cit. pl. XLIX, fig. 52 k and h.

B. pallida, especially with regard to the appearance of the penial setae; however these setae seem not to be quite similar, for, according to Michaelsen's description and figures, they are of larger size, more curved and only furnished with tubercles at their concave side. Also his description of the prostata-glands »sehr fein, schlank, schlauchformig" does not exactly correspond to our species. As Michaelsen however only had a single specimen at his disposal, and his description therefore remained somewhat incomplete, it is difficult to decide whether our specimens belong to the same species.

Leyden Museum, June 1899.

NOTE IV.

ON A NEW VARIETY OF
LEPTOPOMA MANADENSE PFR.

BY

M. M. SCHEPMAN.

The specimens of a lot of a *Leptopoma*, collected by Baron von Rosenberg at Gorontalo, Celebes, have the general appearance of some varieties of *L. vitreum* Lesson, but their columellar margin is simple. I had compared them with the species of the genus known from Celebes, but I could not identify them with any of these. So I sent a few specimens to Prof. E. von Martens and asked his advice, and this author declared them to be a variety of *L. manadense* Pfr. (As I had compared them with typical specimens of this species agreeing with the figure in Pfeiffer's *Novitates conchologicae*, Vol. IV, pl. 128, fig. 9, I did not come to this identification). The specimens indeed agree rather well with the figure of von Martens' *Ostasiat. Laudschn.* (Pl. 2, fig. 8), but as this figure differs much from the typical one and from the original description, I thought it might be somewhat erroneous; now this figure may serve for the new variety, which I describe under the name of:

Leptopoma manadense Pfr. var. *obsoleta*.

The shell differs from typical ones by the peripheral keel, which in most of the specimens is only indicated at

the beginning of the last whorl and disappears towards the aperture, being only faintly visible on the whole whorl in very few specimens, the supra-peripheral keels are entirely wanting; right margin of aperture without the angle resulting from the keel in typical specimens.

The shells vary much in coloration, they are white, with or without a brown band at or slightly below the periphery, the upper part is spotted or flamed with brown, the spots and flames varying in size, a few specimens have a brownish yellow ground-colour; the lower part of the last whorl is lighter. Shape and size agree with typical specimens.

Rhoon near Rotterdam, June 1899.

NOTE V.

NEUE PAUSSIDEN,

MIT EINEM BIOLOGISCHEN NACHTRAG

VON

E. WASMANN S. J.

(Tafel 3 und 4).

(98. Beitrag zur Kenntniss der Myrmekophilen u. Termitophilen).

Herr R. Oberthür hatte die Güte, mir eine Reihe neuer Paussiden seiner Sammlung zur Beschreibung zu übersenden. Einige andere Arten wurden von Herrn C. Ritsema aus dem Rijksmuseum von Leiden eingesandt. Hiezu kommt noch eine von Dr. Hans Brauns und eine von Herrn Rob. Ch. Wroughton aufgefundene Art. Ich statue den Herren Einsendern hiermit meinen Dank ab. Leider liegt nur für eine einzige der hier erwähnten Paussiden die Angabe der Wirthsart vor.

Nach der Beschreibung der Arten werde ich einen Nachtrag beifügen zu der in Band XVIII der »Notes''¹⁾ S. 75 und 76 gegebenen Liste der Paussiden-Wirthe.

Homopterus aequatoriensis, n. sp.

(Taf. 3, Fig. 1, 1a Vorderfuss).

Piceus, antennis pedibusque castaneis, nitidissimus, glaber. Caput thoracis latitudine, transversum, vix convexum, ocu-

1) Einige neue Paussus aus Java, mit Bemerkungen über die myrmecophile Lebensweise der Paussiden, S. 63—80.

lis maximis, prominentibus. Antennae 10-articulatae, valde compressae, planae, subparallelae, capite duplo angustiores, capite thoraceque paullo longiores. Thorax transversus, subtiliter marginatus, basin versus modice angustatus, vix cordiformis, longitudinaliter canaliculatus, prope angulos posticos foveolatus. Elytra utrimque foveola basali instructa, lateribus subrotundatis. Tibiae basi angustae, apicem versus sensim dilatatae, compressae; anticae sinuatae et apice emarginatae. Tarsi breves, art. 1^o et 2^o angustis, perbrevis, 3^o et 4^o late bilobatis, 5^o ceteris unitis longitudine aequali. — Long. 5,5 mm.

Antennae: Art. 1^o crasso, globoso, 2^o latitudine 1i, sed brevissimo, vix visibili; 3^o—10^{um} valde transversis, latitudine subaequalibus, 3^o dimidio longiore 4^o, 4^o—9^{um} longitudine aequalibus, 10^o duobus praecedentibus unitis longitudine aequali, apice rotundato.

Von *H. brasiliensis* Westw. besonders durch die schmaleren Fühler, deren Glied 1 und 2 ganz anders gebildet ist, verschieden. Ueberdies durch geringere Grösse, dunklere Färbung, stark glänzende, glatte Oberfläche, breiteres Halsschild, seitlich gerundete Flügeldecken und die namentlich an der Basis schmaleren Schienen von jener Art abweichend.

Ein Exemplar aus der Sammlung von Herrn R. Oberthür lag mir vor mit der Etiketke: »Ecuador, Semiradski, 1882—83.»

Die Verwandtschaft mit den Carabiden tritt bei *Homopterus*, besonders bei obiger Art, stärker hervor als bei den übrigen Paussiden; sie äussert sich namentlich in der Erweiterung der Tarsen, die, wie die Form des Halsschildes und des gesammten Rumpfes, an *Lebia* erinnert.

Von *Cerapterus myrmidonum* Kolbe (Ent. Nachr. 1896, n^o. 19) lag aus R. Oberthür's Sammlung ein Exemplar vor mit der Etiketke: »Semnio, Njam-Njam (Bohndorff!)», welches aus derselben Quelle stammt wie Kolbe's Original-exemplar und auch in allen Einzelheiten der Beschreibung, selbst in der Grösse, mit letzterem übereinstimmt.

Für neu halte ich dagegen die folgenden von R. Oberthür zur Ansicht vorliegenden Arten:

Cerapterus longipennis, n. sp.

Gracilis, nigropiceus, antennis pedibusque rufopiceis, subnitidus, densius fulvohirsutus; elytrorum macula hamata apicali ferruginea intus abbreviata instructa. Antennae capite thoraceque multo longiores, latitudine fere quintuplo longiores. Thorax longitudine plus duplo latior, margine antico et postico subtiliter punctato. Elytra latitudine duplo et dimidio longiora, subtilissime alutacea (propterea parum nitida), seriebus punctorum subtilium regularium extra regionem suturalem instructa; limbo apicali recurvo utrimque remote 4-dentato. — Long. 14 mm.

Mit *Cerapterus hottentottus* Kolbe (Ent. Nachr. 1896, n^o. 19) nahe verwandt, von derselben, auffallend schlanken Gestalt, auch mit ähnlicher Fühlerbildung und Punktirung der Flügeldecken. Er unterscheidet sich jedoch von ihm durch den ganz verschiedenen Apicalsaum der Flügeldecken, der nicht wie bei *C. hottentottus*, *Smithi* und *concolor* fein und dicht gezähnelte ist, sondern jederseits nur vier grosse, weit von einander abstehende Zähne aufweist. Ferner ist *C. longipennis* viel dichter fuchsig behaart als *hottentottus*, das Halsschild ist breiter, am Vorder- und Hinterrande fein aber deutlich punktirt, die Punktreihen der Flügeldecken beginnen bereits nahe der Naht (sind also zahlreicher als bei *hottentottus*) und die Körpergrösse ist eine viel geringere. Er stammt vom Tanganika-See, während *hottentottus* am Ngami-See in Südafrika gefunden wurde.

1 Exemplar mit der Etiketle: »Région de M. Pala, Tanganika, (R. P. Guillemé!)».

Nur mit Bedenken beschreibe ich die folgende *Cerapterus*-Art als neu, da mir kein Exemplar von *C. Lafertei* Westw. zum Vergleiche vorliegt und ich nur nach der Beschreibung und Abbildung im Thes. Ent. Oxon. urtheilen kann.

Cerapterus Denoiti, n. sp.

Nigropiceus, nitidus, antennis pedibusque piceis, elytrorum macula ferruginea hamata a medio usque ad apicem pertingente. Antennae breves, latissimae, elytrorum basin tantum attingentes, absque articulo basali latitudine duplo tantum longiora. Thorax longitudine plus duplo latior, impunctatus, linea longitudinali media impressa. Elytra brevia, densius subtiliter punctata, margine apicali simplici. Tibiae latissimae, etiam posticae latitudine vix dimidio longiores. — Long. 11,5 mm.

Mit *C. Lafertei* Westw. nahe verwandt, aber mit noch kürzeren, breiteren Fühlern und kürzeren, breiteren Schienen. Die Fühler erreichen nur den Hinterrand des Halsschildes, ihre Keule (Glied 2—10) ist nur doppelt so lang als breit, die Glieder 3—9 fast linienförmig wegen ihrer Kürze und grossen Breite, Glied 10 fast so lang wie die 4 vorhergehenden zusammen.

Die Schienen sind ebenfalls sehr breit und kurz, kaum um die Hälfte länger als breit. Die Färbung und Punktierung der Flügeldecken entspricht dem *C. Lafertei*; sie sind fein und ziemlich dicht punktirt und haben einen bereits in der Mitte beginnenden rothgelben Hakenfleck, dessen beide Aeste (am Rande und an der Naht) gleich lang sind und einander parallel laufen.

Das Halsschild ist sehr breit, schwarzbraun, mit deutlicher Mittellinie.

Von *Cerapt. trinitatis* Kolbe (Ent. Nachr. 1896, n^o. 19), der ebenfalls sehr breite Fühler und Schienen besitzt, besonders durch den einfachen Spitzensaum der Flügeldecken und den langen rothgelben Hakenfleck derselben verschieden.

1 Exemplar mit der Etikette: »Uganda, R. P. Denoit!« aus R. Oberthür's Sammlung lag vor. Ich benenne die Art zu Ehren des Entdeckers.

Paussus sesquisulcatus, n. sp.

(Taf. 3, Fig. 2, Fühlerkeule).

P. Hearseyano proximus, rufocastaneus, elytris nitidis, capite thoraceque subnitidis, punctatus, elytris nigris, sutura et marginibus rufis. Caput longitudine dimidio tantum latius, pone oculos carina elevata transversa alteraque longitudinali mediana tenuiori instructum, occipite leviter emarginato; clypeo impresso, haud emarginato. Antennarum clava integra, brevis et lata, fere trigona, basi postice in spinam conicam producta, margine postico supra oblique bisulcato, sulcis inter se inaequalibus. Prothorax haud bipartitus, in medio constrictus et profunde transversim sulcatus, latitudine distincte longior, pars anterior multo latior posteriore, sed longitudine dimidio tantum latior, lateribus omnino rotundatis, disco longitudinaliter canaliculato. Elytra fortitius punctata, subtiliter parce pilosa. Tibiae angustae. — Long. 9 mm.

4 Exemplare, von Herrn Rob. Ch. Wroughton bei Lampenlicht gefangen, Nord-Guzerath, Ostindien.

Zur Unterscheidung von *P. Hearseyanus* Westw., den ich von Wroughton aus Poona erhielt, dienen die folgende Merkmale:

P. sesquisulcatus.

Fühlerkeule breiter, gegen die Spitze stärker verengt, fast dreieckig; oben nur mit zwei Querfurchen, deren äussere nur halb so lang ist als die innere (»*sesquisulcatus*»). (Fig. 2).

Kopf nur um die Hälfte breiter als lang, sein Hinterrand schmal u. schwach aus-

P. Hearseyanus.

Fühlerkeule schmaler, fast parallelseitig; oben mit drei unter sich gleich langen Querfurchen. (Fig. 3).

Kopf mehr als doppelt so breit als lang, der Hinterrand breit und tief ausgeschnitten,

geschnitten, das Kopfschild vorne nur eingedrückt, nicht ausgeschnitten.	das Kopfschild vorne eingedrückt und ausgeschnitten.
Prothorax deutlich länger als breit, der Vordertheil kaum mehr als doppelt so breit als lang.	Prothorax etwas breiter als lang, der Vordertheil reichlich dreimal so breit als lang.
Sculptur matter durch stärkere Runzelung.	Sculptur des Körpers glänzender durch schwächeren Runzelung.

Von beiden Arten lagen ♂ und ♀ vor; die obigen Unterschiede sind also keine sexuellen Charaktere. Auch die grossen *P. Harseyanus* und *sesquisulcatus* sind, obwohl noch nicht in den Ameisennestern gefunden, doch ziemlich sicher echte Ameisengäste, worauf das gelbe Haartoment in den Furchen der Fühlerkeule hinweist.

Paussus semilineatus, n. sp.

P. lineato Thunbg. proximus, ejusdem magnitudinis, formae et coloris (ruber, elytrorum disco nigro), sed differt sculptura omnino aliena, nitida, elytris subtilissime alutaceis, seriatopunctatis, clypeo antice profunde canaliculato, denique antennarum clava apice rotundata, nitida, parce punctata, impressionibus marginis superioris, praesertim ultima (ante apicem) minus profundis. — Long. 6,5 mm.

Da ich ein von Raffray übersandtes Exemplar des *P. lineatus* Thunbg. aus Capstadt besitze, welches ich für typisch halte, sehe ich mich genöthigt, die oben beschriebene Form als neue Art aufzustellen, da sie in der Sculptur sowie in der Form der Fühlerkeule von ersterem bedeutend abweicht. Die Unterschiede sind folgende:

P. lineatus Thunbg.: Matt, fast glanzlos, die Flügeldecken sehr dicht runzlig punktirt, ohne Punktreihen. Die Längsrinne des Clypeus kurz und undeutlich. Die Fühler-

keule an der Spitze abgestutzt, glanzlos, sehr dicht körnig punktirt, der obere Rand mit 5 scharfen Quereindrücken, von den der letzte (vor der Spitze befindliche) sehr tief und breit grubenförmig ist.

P. semilineatus Wasm.: Thorax stark glänzend, Flügeldecken etwas minder stark, nur der Kopf matt. Flügeldecken sehr fein chagriniert, mit deutlichen Punktreihen. Die Längsrinne des Clypeus lang und deutlich vertieft. Die Fühlerkeule an der Spitze gerundet, glänzend, sehr fein chagriniert und spärlich punktirt, die 5 Eindrücke des oberen Randes seicht, besonders der letzte (vor der Spitze befindliche).

1 Exemplar lag vor, von Herrn Dr. Hans Brauns bei Port Elizabeth (Capkolonie) im Nest von *Acantholepis capensis* Mayr entdeckt.

Von *P. Afzelii* Westw. (*laetus* Gerst.) unterscheidet sich *semilineatus* besonders durch den Mangel der Tuberkeln am oberen Fühlerrande und die viel schwächeren Eindrücke.

Paussus liber, n. sp.

(Taf. 3, Fig. 4).

Rufobrunneus, opacus, elytris praeter basin nigris, corpore supra pilis brevissimis flavis haud dense vestito. Caput dense granulatum, antice vix emarginatum, a clypeo usque ad medium frontem longitudinaliter canaliculatum, vertice tenuiter bifoveolato, postice transversim plicato. Antennarum clava parva, breviter ovali, ejus longitudine latitudinem paullo tantum superante, utrimque convexa, antice et postice acute marginata, basi supra obtuse dentata, facie ejus anteriore squamulis flavis ornata. Thorax alutaceus, latitudine vix longior, profunde bipartitus, sulca utrimque flavosetosa; pars thoracis anterior capitis latitudine, vix elevata, haud brevior posteriore, in medio canaliculata, angulis lateralibus rotundatis; pars posterior paullo angustior anteriore, lateribus parallelis, antice profunde depressa, in medio obsolete canaliculata. Elytra parallela,

dense rugosopunctata, omnino opaca. Pedes breves, tibiis compressis, late parallelis. Pygidium supra postice oblique impressum, marginatum. — Long. 6 mm.

Eine Art, deren Verwandtschaft ziemlich schwer festzustellen war. Unter den Arten mit tief zweitheiligem Thorax ausgezeichnet durch die relativ sehr kleine, blasenförmige, beiderseits scharf gerandete Fühlerkeule, deren Basis oben einen mässig langen, stumpfen, dreieckigen Zahn hat.

Von *P. cilipes* und *armatus* Westw., die eine ähnliche Fühlerbildung haben, durch den Mangel des Stirnhornes verschieden; von *P. laevifrons*, *affinis* und *cognatus* Westw., durch den tief zweitheiligen Prothorax verschieden.

Im übrigen in der Gestalt ähnlich dem ostindischen *P. cognatus*, der eine ähnliche, relativ ebenso kleine Fühlerkeule und ähnliche, aber stärkere Stirneindrücke besitzt.

Ein Exemplar (♀) aus dem Rijksmuseum von Leiden lag vor, mit der Etikette: »Stampfli, Junkriver, Liberia».

Paussus Humboldti Westw. und Var. *laevicornis* m.

Von *P. Humboldti* Westw. lagen mir aus dem Leidener Rijksmuseum 2 Exemplare vor aus Liberia (Stampfli, Junkriver). Das kleinere misst 9 mm., das grössere 12 mm. Beide stimmen mit *Humboldti* Westw. im wesentlichen überein und wurden auch von C. A. Dohrn als diese Art bestimmt. Bei dem grösseren der beiden Stücke ist jedoch der Thorax von der Breite des Kopfes, bei dem kleineren ist es sogar eher etwas schmaler als den Kopf [bei Westwood heisst es (Thes. Ent. Oxon. p. 83) »prothorace capite evidenter latiore»]. Bei dem kleineren sind die 4 Querfurchen auf der Fühlerkeule deutlich, wenngleich sehr schwach; bei dem grösseren ist die Keule ganz glatt und selbst bei starker Vergrösserung sind keine Querfurchen zu erkennen (Var. *laevicornis* Wasm.).

Von *Paussus Waterhousei* Westw. (Thes. Ent. Oxon. p. 90, Pl. XVI, Fig. 4) lagen mehrere Exemplare vor, die

ich trotz der beim Vergleich mit Westwoods Beschreibung und Abbildung sich ergebenden kleinen Differenzen nicht von jener Art zu trennen wage. Die Seitenecken des vorderen Prothoraxtheiles sind nicht so spitz vortretend und die Breite desselben daher kaum oder nicht bedeutender als die Kopfbreite. Der Scheiteleindruck bildet nicht eine tiefe ringsum gerandete Grube, sondern zwei hohe, fast ohrmuschelförmige Höcker, deren Höhlungen einander zugewandt und durch eine breite Längsfurche getrennt sind.

Die Fundorte der 4 mir vorliegenden Exemplare sind:

Tandjong Morawa, Serdang (N. O. Sumatra), Dr. B. Hagen! — 1 Ex. aus dem Rijksmuseum (5 mm. lang).

Malacca, Perak, W. Doherty! — 2 Ex. aus R. Oberthür's Sammlung (6 mm. lang).

Haute Birmanie, État de Momeit, 660 M., W. Doherty! 1890. — 1 Ex. aus R. Oberthür's Sammlung (6 mm. lang).

Das Exemplar aus dem Rijksmuseum wurde auch von C. Ritsema als *Waterhousei* bestimmt.

Von *Paussus Klugi* Westw. lagen aus R. Oberthür's Sammlung 3 Exemplare vor vom Kilima Ndjaro (Ostafrika), von R. P. Le Roy 1890 gesammelt. Dieselben unterscheiden sich von den südafrikanischen Stücken nur durch ein wenig stärkeren Querwulst des Hinterkopfes und ein wenig stärkere Punktirung der Flügeldecken. Der Fundortsetikette war beigefügt »en compagnie de petites fourmis.»

Paussus LeRoi, n. sp.

(Taf. 3, Fig. 5, Fühlerkeule).

Niger, subnitidus, nudus, subtilissime alutaceus, corporis forma angusta. Caput carinis duabus longitudinalibus a vertice transversim sulcato usque ad apicem instructum, inter carinas sulcatum, inter carinas et oculos impressum. Antennarum clava capite dimidio longior, elongata, compressa, paullo curvata, a basi usque ad apicem subtruncatum sensim angustata, facies ejus anterior sulca longitudi-

nali instructa, margo posterior totus anguste sed profunde sulcatus, sulca 6-foveolata, marginibus sulcae haud dentatis, omnino integris. Thorax profunde bipartitus, pars anterior capite vix latior, brevis, elevata, in medio sulcata, latior posteriori; posterior lateribus parallelis, antice profunde depressa, utrimque flavofasciculata, postice longitudinaliter impressa. Elytra subtilissime alutacea, parallela. Pygidium infra alte marginatum. Pedes breves, lati, tibiis compressis, posterioribus valde dilatatis. — Long. 6 mm.

Eine schlanke Art, von der Gestalt und Grösse des *P. Klugi* Westw., auch durch die Fühlerbildung zur *Klugi*-Gruppe gehörig. Der lange, breit längsgefurchte Kopf gehört jedoch einem ganz anderen Typus an und erinnert an *P. Shuckardi* und *Curtisi*, sowie an *Germari* und *Schaumi*. Die Fühlerkeule (Fig. 5) von *LeRoiyi* ist so lang wie der Kopf und der vordere Theil des Prothorax zusammen, sehr schwach aber doch deutlich gekrümmt, von ähnlicher Form wie bei *P. Klugi*, aber breiter und seitlich stärker zusammengedrückt, nicht parallel, sondern von der Basis bis zur sehr stumpf gerundeten, fast abgestutzten, Spitze geradlinig verengt; der Vorderseite zeigt eine durchgehende breite Längsfurche, der Hinterrand ist schmal und tief von der Basis bis zur Spitze gefurcht, mit 6 Gruben innerhalb der Furche, aber mit völlig geraden, ungezähnten Rändern der Furche. Die verbreiterten Schienen, besonders die Hinterschienen, unterscheiden diese Art ebenfalls von allen Verwandten.

1 Exemplar, N'guru, Zanzebar, R. P. Le Roy! Ich benenne die Art zu Ehren des Entdeckers. — In Mus. R. Oberthür.

Paussus pallidefulvus, n. sp.

(Taf. 3, Fig. 6, Fühlerkeule).

Pallide testaceus, opacus, dense scabreque granuloso-punctatus, pilis brevibus flavis paullo depressis vestitus. Caput profunde lateque excavatum. Antennarum clava (Fig.

6) longa, ensiformis (fere ut in *P. Germari*), valde compressa, distincte curvata, a basi usque ad apicem paullo dilatata, apice rotundato; angulo basali externo omnino obtuso, rotundato, margine postico vix canaliculato. Thorax bipartitus, pars anterior elevata, haud latior posteriore, in medio canaliculata; pars posterior basin versus attenuata, angulis anticis rotundatis, in medio depressa et postice trisulcata. Elytra seriatim breviter pilosa et fortius punctata. Pedes mediocres, haud dilatati. — Long. 5 mm.

Zur Gruppe von *P. Germari* Westw. gehörig, von seinen Verwandten verschieden durch die blass gelbbraune Färbung, die tief ausgehöhlte Oberseite des Kopfes und namentlich durch die Form der Fühlerkeule (Fig. 6). Dieselbe ist länger als der Kopf und Vordertheil des Thorax zusammen, von der halben Breite des Kopfes, ganz platt, von der Basis zur Spitze deutlich gekrümmt und schwach erweitert, mit gerundeter Spitze und ganz stumpfen, völlig gerundetem Basalzahn; der Hinterrand der Fühlerkeule ist kaum sichtbar schmal gefurcht. Die Fühlerkeule ist mit kurzen, gegen die Fühlerspitze geneigten Härchen besetzt.

1 Exemplar aus R. Oberthür's Sammlung lag vor mit der Etikette: »Franceville, ex Musaeo Gambey, 1882».

Zur *Germari*-Gruppe gehört auch *P. Grandidieri* (Sikorai) Pouj. (Bull. Soc. Ent. Fr. 1891, pp. XXXVI et LII. — Le Naturaliste (2) n^o. 140, 1 Janv. 1893, p. 15). Ich gebe eine Abbildung der Art nach einem von R. P. Camboué, Tananariva, Madagascar, 1889 gefangenen Exemplar aus der Sammlung R. Oberthür's. (Taf. 3, Fig. 7).

Paussus quadricornis, n. sp.

(Taf. 4, Fig. 8, Fühlerkeule).

Niger, capite, antennarum clava, prothoracis parte anteriore, elytrorum basi, marginibus et apice extremo rufis; paullo nitidus, elytris parce breviterque pilosis, marginibus eorum lateralibus et margine posteriore podicis longius rufo-setosis. Caput nitidum, punctatum, clypeo emarginato,

vertice elevato, late aperto (perforato). Antennarum art. 1^o valide punctato; antennarum clava (antice visa) elongato-quadrata (Fig. 7), apice haud angustior quam basi, infra acute marginata, supra profunde lateque excavata, excavationis marginibus obtuse dentatis, margine postico vix setigero; dente superiori basali clavae lato, longo et reflexo, inferiori parvo; clava praeter marginem superiorem nitidum opaca, densissime punctata. Prothorax nitidus, punctatus, longitudine paullo latior, capite paullo angustior, pars ejus anterior et posterior ejusdem latitudinis; pars anterior brevis, valde elevata, in medio canaliculata, lateribus utrimque profunde excisis et propterea *bidentatis*; pars prothoracis posterior antice profunde lateque depressa, depressione laevi, longitudinaliter canaliculata. Elytra parallela, dense alutacea, vix nitida. Pygidium flavosetosum. Pedes mediocres, tibiis paullo compressis, vix dilatatis. — Long. 6 mm.

Gehört zur Gruppe des *P. denticulatus* Westw., mit dem er in Körperform, Bildung des Halsschildes und der Fühlerkeule verwandt ist. Er unterscheidet sich jedoch von diesem wie von sämtlichen Verwandten besonders durch die (von vorn gesehen) rechteckige, an der Spitze sehr breit abgestutzte Fühlerkeule (Fig. 8), welche fast an *P. Fichteli* Donov. erinnert; ferner durch den jederseits tief ausgeschnittenen und daher jederseits zweizähligen Vordertheil des Prothorax. Von *denticulatus* überdies verschieden durch den schmälern Hintertheil des Prothorax und den nur ganz stumpf gezähnten, mit sehr kurzen Börstchen versehenen Hinterrand der Aushöhlung der Fühlerkeule, sowie durch die sehr kurze und spärliche Behaarung der Flügeldecken. Von *P. nauceras* Bens. verschieden durch die kurze, spärliche Behaarung, den Mangel eines Mittelkieses auf der Stirn und die viel breitere Fühlerkeule. Von *P. Bowringi* Westw. verschieden durch die matte Sculptur der Fühlerkeule, durch die Bildung des Scheitels, welcher höckerartig aufgetrieben und mit einem einfachen, weiten Loch versehen ist (nicht mit 2 kleinen Höckern); ferner auch durch die kurze, spärliche Behaarung und durch die Form des

Prothorax. Von *P. politus* Westw., mit dem die Behaarung der Flügeldecken übereinstimmt, verschieden durch die viel breitere Fühlerkeule sowie durch die tief ausgeschnitten Seiten des Vordertheils des Prothorax. Von *P. ploiophorus* Bens. verschieden durch die spärliche, kurze Behaarung, durch den schmäleren, hinteren Halsschildtheil, durch den Mangel grosser gelber Haarbüschel am Pygidium, endlich durch den viel stärker entwickelten Basalzahn der Fühlerkeule.

Ein Exemplar aus R. Oberthür's Sammlung lag zur Ansicht vor, mit der Etikette: »Haute Birmanie, État de Momeit, 600 m. Doherty! 1890.»

Paussus semirufus, n. sp.

(Taf. 4, Fig. 9).

Niger, elytrorum dimidio posteriore laete rubro, ventre piceo, opacus, clytris nitidis. Caput dense granulosum, clypeo antice profunde depresso et emarginato, in medio carinatum, carina usque ad fossam verticis attingente, vertice elevato, elevatione in medio perforata. Antennae art. 1^o grosse punctato et granulato; clava antennarum elongata, latitudine triplo longior, lateribus parallelis, infra acute marginata, supra profunde a basi usque ad apicem excavata, excavatione transversim sulcata, excavationis margine antico vix, postico distincte dentato, dentibus piligeris; dense punctata et opaca praeter margines superiores nitidos. Collum inter caput et thoracem valde distinctum. Thorax dense granulosus, longitudine haud latior, profunde bipartitus; pars anterior brevis, capite paullo latior, alte elevatus, cristatus, in medio et utrimque ante angulos laterales acutos profunde excisus; sulca inter partem anteriorem et posteriorem utrimque tenuiter flavopenicillata; pars posterior multo angustior anteriore sed longior, lateribus antice paullo dilatatis et laevigatis, antice in medio profunde depressa, postice obsolete foveolata. Elytra thorace duplo latiora, parallela, lateribus flavopilosis, antice dense,

postice vix punctata, punctis majoribus subseriatis et piligeris. Pygidium supra flavosetosum, margine postico elevato et utrimque flavopenicillato. Pedes mediocres, tibiis compressis. — Long. 7 mm., lat. elytr. 2,5 mm.

Eine sehr ausgezeichnete Art, in Körpergestalt, Bildung des Kopfes, des Halsschildes und der Fühlerkeule verwandt mit *P. Ludekingi* Voll., *Andreae* Rits., *Ritsemae* Wasm. und *Lucasseni* Wasm. (Notes Leyd. Mus. XVIII, p. 66). Sie unterscheidet sich von allen diesen Arten leicht durch die viel schmälere und schlankere Fühlerkeule, sowie durch die scharf zweifarbigen Flügeldecken, ferner auch durch die Form des vorderen Halsschildtheiles, welcher stärker kragenförmig erhaben und mit 3 tiefen Ausschnitten versehen ist, sowie durch die schlankere, dem *P. Kannegieteri* Wasm. ähnlichere Körpergestalt. Von letzterer Art trennt sie die hinten tief sackförmig ausgehöhlte Fühlerkeule, die Färbung etc.

1 Exemplar, aus R. Oberthür's Sammlung, mit der Etiketle: »Lamblong, 5.80; ex Musaeo van Lansberge». (Lamblong liegt nach Herrn C. Ritsema's Mittheilung in der Regentschaft Rembang, am Flusse Blitong auf Java).

Paussus javanus, n. sp.

(Taf. 4, Fig. 10, Fühlerkeule).

Brunneus, subnitidus, pilis erectis brevibus vestitus, in elytris pilis longioribus erectis hirsutus. Antennarum clava similis *P. Kannegieteri* Wasm., sed brevior et magis inflata (vgl. Fig. 10 u. 11), breviter ovalis, basi tridentata, dente postico longo et acuto, dente medio obtuso; clava supra (margine postico) leviter et anguste sulcata, sulcae margine postico obtuse dentato, dentibus piligeris. Caput thorace vix angustius, rugulosum, margine antico exciso et depresso, clypeo longitudinaliter carinato, fronte cornu brevi, apice aperto, instructa. Thorax subtiliter rugulosus, pars anterior latior et paullo brevior posteriore, postice longitudinaliter sulcata, angulis lateralibus subacutis; pars pos-

terior lateribus parallelis, antice in medio profunde excavata. Elytra coriacea, seriebus punctorum piligerorum instructa, angulo apicali externo tuberculato. Pygidium margine inferiore longe denseque flavofasciculato. Pedes angusti, sat longi. — Long. 5,5 mm.

Gehört mit *P. Kannegieteri* Wasm. (Notes Leyd. Mus. XVIII, p. 67 u. Taf. 1, Fig. 2) zu jener Abtheilung der javanischen *Paussus*, die einen Uebergang zwischen den Arten mit eiförmiger (nicht ausgehöhlter) und mit muschelförmiger (tief ausgehöhlter) Fühlerkeule bilden; die eiförmige, stark blasenförmig verdickte Keule ist nämlich an ihrem Hinterrande nicht ausgehöhlt sondern nur flach gefurcht, die Furche am Hinterrande gezähnt; an der Basis der Keule befinden sich 3 Zähne. *Javanus* unterscheidet sich von *Kannegieteri* durch die braune Färbung, die dichtere Punktirung und Behaarung, den kürzeren Prothorax und namentlich durch die viel kürzere und dickere Fühlerkeule (vgl. die Fig. 10 u. 11), an welcher der Rand der Rückenfurche nur ganz stumpf gezähnt ist; von den 3 Zähnen der Basis ist der hintere noch länger und spitzer als bei *Kannegieteri*, der mittlere viel undeutlicher und stumpfer; zwischen dem mittleren und dem vorderen Zahn findet sich ein tiefer Ausschnitt.

1 Exemplar aus R. Oberthür's Sammlung lag vor, mit der Etikette »Java, Ardjoeno, ex Musaeo van Lansberge».

Paussus Oberthüri, n. sp.

(Taf. 4, Fig. 12, 12a Thoraxprofil von vorne).

Rufobrunneus, opacus; capite subnitido, clypeo latissimo, utrimque elevato et paullo producto, in medio profunde exciso; vertice trifoveolato; antennarum clava naviformi, postice profunde longeque excavata, excavatione transversim sulcata, marginibus excavationis intus subdentatis; thorace elongato, parte ejus anteriore elevata, in medio impresso, ante angulos laterales spiniformes profunde sinuata, parte posteriore in medio pro-

funde excavata, excavatione trisulcata, lateribus antice acute productis; elytris subtilissime pubescentibus, apice setis fulvis brevibus instructo. Pedes mediocres, vix compressi. — Long. 6 mm.

Mit *P. Humbloti* Raffr. und *opacus* Kr. verwandt, besonders mit letzterem. Von ersterem durch die matte Sculptur, die einförmig braunrothe Färbung und der Bildung der Fühlerkeule verschieden, deren Vorderrand keine Grübchen besitzt sondern nur furchenartig eingedrückt ist. Mit *P. opacus* Kr. in der matten Sculptur und in der Form der Fühler sehr ähnlich, aber schlanker, mit glänzenderem, längerem Kopfe, stärker erweitertem und verlängertem Kopfschild und grösserer Fühlerkeule, die noch stärker ausgehöhlt ist. Die Vorderecken des breiten Kopfschildes sind nicht niedergedrückt, sondern schwach aufgebogen. Die Scheitel hat drei tiefe scharf begrenzte Eindrücke, von denen der mittlere furchenförmig, die seitlichen grubenförmig sind. Der vordere Theil des Prothorax ist ganz anders als bei *opacus*, indem die Scheibe zu beiden Seiten des Mitteleindruckes stärker gewulstet ist und die Seiten vor den spitzen dornförmigen Seitenecken tief ausgebuchtet sind, während sie bei *P. opacus* geradlinig bis zu den stumpfen Seitenecken verlaufen (vgl. Fig. 12 a u. 13). Ferner ist der Prothorax bei *opacus* nur so lang als breit, bei *Oberthüri* fast um ein Drittel länger als breit.

Von *P. Sikoramus* Dohrn unterscheidet ihn der Mangel der Tuberkeln auf den Flügeldecken, die verschiedene Sculptur und Grösse. Von *P. Sikorai* Pouj. (*Grandidieri* Pouj.) namentlich die kahnförmige, nicht beilförmige Fühlerkeule (vgl. Fig. 7 u. 12).

In der Furche zwischen Vorder- und Hintertheil des Halsschildes steht jederseits ein kleiner gelber Haarbüschel und die Spitze der Flügeldecken ist wie bei *opacus* mit einer Reihe kürzerer dornförmiger Haarpinsel besetzt, vor denen einfache Börstchen stehen.

2 Exemplare aus der Sammlung René Oberthür's lagen vor mit der Etiketle: »Nordmadagascar, Antakares, Isoki-

traa Diego Suarez, Mai à Octobre 1891, E. & B. Perrot!"
 Ich erlaube mir, die schöne Art meinem Freunde Herrn
 R. Oberthür zu dedicieren.

Paussus Perroti, n. sp.

(Taf. 4, Fig. 14, Clypeus).

Rufobrunneus, totus opacus, capite brevi, profunde impresso et utrimque tuberculato, tuberculo aperto (perforato); antennarum clava elongata, naviformi, postice profunde excavata; clypeo brevi, exciso, utrimque haud producto, anguste nigro-marginato. — Long. 6 mm.

Mit *P. opacus* Kr. ebenfalls nahe verwandt, von ihm jedoch durch den tief eingedrückten, jederseits beulenartig aufgetriebenen Oberkopf verschieden; jede der zwei Beulen bildet ein kurzes, offenes Scheitelhorn. Auch ist die Fühlerkeule viel länger und schmaler als bei *P. opacus*, gegen die Spitze ganz allmählich stark verengt (daher von vorne gesehen fast spitz-dreieckig); sie ist mehr als doppelt so lang als an der Basis breit und der Hinterrand ihrer Ausbuchtung tritt nicht so hoch vor wie bei *P. opacus*. Von dem gleichfalls nahe verwandten *P. Oberthüri* Wasm. durch das seitlich nicht ausgeschnittene Halsschild und durch den viel kürzeren, glanzlosen, viel tiefer und breiter eingedrückten Kopf verschieden. Das Kopfschild ist viel kürzer und schmaler als bei jenen beiden Arten, in der Mitte nur ausgerandet und an den Seiten nicht aufgebogen oder vorgezogen; es ist fein schwarz gerandet (vgl. die Fig. 12, 13a, 14).

2 Exemplare »Madagascar, Antsianaka, Frères Perrot, 2^e Semestre 1890" aus R. Oberthür's Sammlung lagen vor. Ich benenne die Art zu Ehren der Entdecker.

Zur Unterscheidung der drei nahe verwandten, glanzlosen, rothbraunen Arten mit muschelförmiger Fühlerkeule, *P. opacus* Kr., *Oberthüri* Wasm. und *Perroti* Wasm. diene folgende Uebersicht:

a. Clypeo (Fig. 12) lato, producto, profunde bilobato,

Notes from the Leyden Museum, Vol. XXI.

- lobis rotundatis. Fronte profunde trifoveolata (Fig. 12).
 Thoracis partis anterioris lateribus utrimque profunde
 excisis (Fig. 12a). *Oberthüri* Wasm.
- b. Clypeo (Fig. 13a) lato, producto, quadrato, in medio
 anguste exciso. Fronte in medio leviter impressa. Tho-
 racis partis anterioris lateribus haud excisis (Fig. 13).
opacus Kraatz.
- c. Clypeo (Fig. 14) brevi et angustato, in medio exciso,
 anguste nigro-marginato. Fronte profunde sulcata et
 utrimque alte tuberculata, tuberculis apice apertis.
 Thoracis partis anterioris lateribus haud excisis.
Perroti Wasm.

NACHTRAG ZUR LISTE DER PAUSSIDENWIRTHE ¹⁾.

Als BERICHTIGUNG zu der dortigen Liste is zu bemerken:
Pheidole jordanica Sauley ist Var. von *megacephala* F.,
 nicht von *sinaitica* Mayr (teste Emery, der die Typen von
jordanica verglichen hat).

Die von Péringuey als *Pheidole capensis* Mayr bezeich-
 nete Wirthsameise von *Paussus Linnei* und *Burmeisteri* ist
 nach einer brieflichen Mittheilung von Dr. Brauns höchst
 wahrscheinlich *Ph. megacephala* var. *punctulata* Mayr.

Als NEUE WIRTHSANGABEN ²⁾ sind den früheren beizufügen:

Bei *Pheidole megacephala* var. *punctulata* Mayr:

Paussus cucullatus Westw. (Capkolonie, Dr. Brauns!,
 P.O'Neil!, sehr häufig).

P. semicucullatus Brauns, n. sp. (Capkolonie, Brauns!).

P. Braunsi Pér. (Capkolonie, Brauns!) ³⁾.

P. Curtisi Westw. (Capkolonie, Brauns!, häufig).

P. granulatus Westw. (Capkolonie, Brauns!).

Bei *Pheidole megacephala* nov. subsp. (nach Emery):

P. Elizabethae Pér. (Capkolonie, Brauns!).

P. cucullatus Westw. (Natal, G. D. Haviland!).

1) Notes Leyd. Mus. XVIII, S. 75, 76.

2) Die Ameisenarten sind von Prof. Emery (Bologna) bestimmt.

3) Dieser *Paussus* ist nicht, wie Péringuey (Trans. Phil. Soc. South-Afr. 1897,
 p. 40) angibt, bei *Pheidole capensis*, sondern bei *Ph. punctulata* gefunden worden.

P. cultratus Westw. (Natal, G. D. Haviland!).

Bei *Tetramorium quadrispinosum* Em.:

P. cochlearius Westw. (Capkolonie, Brauns!).

Bei *Technomyrmex albipes* subsp. *Foreli* Em.:

P. cochlearius Westw. (Capkolonie, Brauns!).

Bei *Acantholepis capensis* Mayr:

P. semilineatus Wasm. n. sp. (Capkolonie, Brauns!).

Dass *P. cochlearius* jene zwei Ameisenarten, die sogar verschiedenen Unterfamilien angehören, als normale Wirthe hat, ist durch Dr. Brauns festgestellt.

Exaeten bei Roermond, Februar 1899.

ERKLÄRUNG DER ABBILDUNGEN

auf Taf. 3 und 4.

(Die Figuren sind gezeichnet mit Microscop Zeiss und Cam. lucida Abbe).

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- Fig. 1. *Homopterus aequatoriensis* Wasm.; 1a Vorderfuss.
 „ 2. Fühlerkeule von *Paussus sesquisulcatus* Wasm. (Vorderansicht).
 „ 3. Fühlerkeule von *Paussus Hearseyanus* Westw. (Vorderansicht).
 „ 4. *Paussus liber* Wasm.
 „ 5. Fühlerkeule von *Paussus LeRoi* Wasm. (Vorderansicht).
 „ 6. Fühler von *Paussus pallidefulvus* Wasm. (Vorderansicht).
 „ 7. *Paussus Grandidieri* Pouj.
 „ 8. Fühlerkeule von *Paussus quadricornis* Wasm. (Vorderansicht).
 „ 9. *Paussus semirufus* Wasm.
 „ 10. Fühlerkeule von *Paussus javanus* Wasm. (Vorderansicht).
 „ 11. Fühlerkeule von *Paussus Kannegieteri* Wasm. (Vorderansicht).
 „ 12. *Paussus Oberthüri* Wasm.; 12a Thoraxprofil (Vorderansicht).
 „ 13. Thoraxprofil (Vorderansicht) von *Paussus opacus* Kr.
 „ 13a. Clypeus von *Paussus opacus* Kr.
 „ 14. Clypeus von *Paussus Perroti* Wasm.
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NOTE VI.

ZOOLOGICAL RESULTS OF THE DUTCH SCIENTIFIC
EXPEDITION TO CENTRAL BORNEO.

THE CRUSTACEANS

BY

Dr. J. G. de MAN.

PART II. BRACHYURA. ¹⁾

(Plates 5—12).

Like the Macrourea, also the Brachyura collected by Dr. Büttikofer in Central Borneo ought to be considered as a valuable contribution to the Carcinological Fauna of this Island. Fifteen species were collected, all but one freshwater forms, inhabitants of the Kapoeas-basin and of the Upper Mahakkam, and of these 14 Land- and Freshwater-species no less than eleven or twelve proved to be new to Science! As far as I am aware, only three freshwater crabs were hitherto known to inhabit the large Island of Borneo, viz. *Parathelphusa tridentata* H. M. E., *Potamon borneense* v. Mart. and *Pot. loxophthalmum* de M. Now, however, this number has increased quintuple! Firstly a remarkable new species of *Menippe* ought to be mentioned,

1) Part I, Macrourea, has been published in Vol. XX, 1898, of this periodical.

that was captured at Sanggau on the Middle Kapoeas. It is closely allied to the rare *Menippe Panope* Herbst from Tranquebar, a species not yet found back since Herbst, as far as I know, and that perhaps once may prove to be also a freshwater crab, whereas the other representatives of *Menippe* and *Myomenippe* are marine forms. A new description and a figure of the equally little-known *Myomenippe Fornasinii*, made after a type-specimen from the Paris Natural History Museum, is added, though this species was not collected. A pretty small *Sesarma* proved also to be new, unfortunately the locality was not defined, but very likely it has been collected at Sintang.

The other 11 or 12 species are all Thelphusidae. *Parathelphusa tridentata* H. M. E. is represented by 15 specimens; this species is, already since 1868, known to inhabit Borneo by von Martens. This author described in the same year also a new *Potamon* from Borneo, *Potamon borneense*, a new variety of which was now collected, probably at Sintang. For this species and for two other new ones a new subgenus *Perithelphusa* is established.

An interesting new species, belonging to the subgenus *Potamon* s. s., was discovered by Dr. Nieuwenhuis on the Upper Mahakkam, and another allied form on Mount Damoes and on the Upper Sibau river. Both were compared with type-specimens of *Pot. sinuatifrons* H. M. E. from the Paris Museum.

On the Liang-Koeboeng Chain a remarkable new *Potamon* was captured, that bears a striking resemblance to *Pot. austenianum* W.-Mas., a species that inhabits Assam and that evidently is represented in Borneo by the new species. The four remaining belong to the subgenus *Geothelphusa* and are all new to science.

Professor Bürger of Göttingen was so kind as to send me the type-specimens of the Thelphusidae described by him in 1894. None of these species from the Philippines and Cape York proved to be identical with those of the Borneo-Expedition and I

could state, moreover, that *Potamon sinuatifrons* H. M. E., the habitat of which was still unknown, is indeed an inhabitant of the Philippine Islands.

As regards the localities where the species were collected, I refer the reader to Dr. Büttikofer's account of the Expedition, published in Vol. XIX, 1897, pp. 1—25.

At the end of this Report one will find a List of all the species of *Potamon* Sav. and *Parathelphusa* H. M. E., hitherto described.

The species collected are the following:

Menippe Ortmanni, n. sp.

Potamon (Parathelphusa) tridentata H. M. E.

» (*Perithelphusa*) *borneense* v. Mart., var. *hilaris*, n.

» » *Büttikoferi*, n. sp.

» » *silvicola*, n. sp.

» sp.

» (*Potamon*) *mahakkamense*, n. sp.

» » *consobrinum*, n. sp.

» » *Melanippe*, n. sp.

» (*Geothelphusa*) *kenepai*, n. sp.

» » *hendersonianum*, n. sp.

» » *Bürgeri*, n. sp.

» » *bicristatum*, n. sp.

Metopograpsus messor Forsk., var. *gracilipes* d. M.

Sesarma (Sesarma) Amphinome, n. sp.

Remarks about the indopacific species of the genera *Menippe* de Haan and *Myomenippe* Hilgd.

Menippe de Haan.

This genus is represented in the Indopacific Region by five species, viz.:

1° *Menippe Rumphii* Fabr. Indian Ocean, Makassar.

2° » *armata* Eyd. & Soul. Sandwich Islands.

3° » *convexa* Rathb. Honolulu.

4° » *Panope* Herbst. Tranquebar.

5° » *Ortmanni*, n. sp. Middle Kapoeas.

Myomenippe Hilgd.

Myomenippe apparently contains only two species:

1° *Myomenippe Hardwickii* Gray.

2° » *Fornasinii* Bianc.

Menippe Rumphii Fabr. is identical with *Menippe Belangeri* H. M. E., but *Menippe Rumphii* H. M. E. is an American species, inhabiting the coast of Brazil (A. Milne Edwards, *Etudes sur les Xiphosures et les Crustacés de la Région Mexicaine*, p. 263, Pl. 48, fig. 4).

Menippe granulosa Strahl (1861) is, according to von Martens (1872), identical with *Menippe Panope* Herbst.

There can be no doubt that *Myomenippe Hardwickii* Gray, the type of which is from the Indian Ocean, and *Myom. duplicidens* Hilgd. from South Celebes are one and the same species (confer: Miers, *Annals and Magazine Nat. History*, Ser. 5, Vol. 5, 1880, p. 233). As I have previously shown (in: *The Journal of the Linnean Society*, Vol. XXII, 1888, p. 40), *Myom. duplicidens* Hilgd. is also identical with *Myom. granulosa* A. M. E. (1867).

The second species of *Myomenippe*, found in the Indo-pacific Seas, is *Myom. Fornasinii* Bianc., described below.

Pelaeus armatus Eyd. & Soul. (*Voyage de la Bonite*) belongs, according to Dana, to the genus *Menippe* and I am of the same opinion. This species, that occurs at the Sandwich Islands, differs by several striking characters from the four other species of this genus. The front is quadridentate, the first and the second antero-lateral tooth are lobate and incised, the third is acuminate anteriorly, the fourth is spiniform.

Menippe quadridens de Haan and *Men. affinis* de Haan, both from the Moluccas, are nomina nuda (*Fauna Japonica*, p. 21).

Menippe parvula de Haan, Cape of Good Hope, is a true *Actaea* (de Mau, l. c. p. 27).

Menippe Martensii Krauss from Natal and the Red Sea is apparently no *Menippe*, because the fingers are excavated and because the cephalothorax and the front have a different shape.

Herklots (*Symbolae carcinologicae*, 1861, p. 11) makes still mention of a *Menippe tetrodon* de Haan from the Moluccas, but this species is not recorded in the »Fauna Japonica.»

Menippe signata White from the Mauritius and *Menippe? Cumingii* White from the Philippine Islands are nomina nuda; the latter is apparently no *Menippe*! (Gray, List of the Crustacea of the British Museum, 1847, p. 19).

Myomenippe Fornasinii Bianc.

(Plate 7, fig. 1).

Galene Fornasinii Bianconi, *Specimina Zoologica Mosambicana*, Fasciculus V, 1851, p. 84.

Galene? hirtipes Jacquinet et Lucas, *Voyage au Pôle Sud et dans l'Océanie etc.* T. III, 1853, Part 3. Crustacés, Pl. IX, fig. 3.

Menippe Leguillouii A. Milne Edwards, *Annales Soc. Entomol. France* (4) T. 7, 1867, p. 274.

Menippe (Myomenippe) Fornasinii Hilgendorf, in: *Monatsbericht königl. Akad. Wiss. zu Berlin*, Nov. 1878, p. 795.

? *Pararuppellia saxicola* Haswell, *Catalogue of the Australian Stalk- and sessile-eyed Crustacea*, 1882, p. 74.

Myomenippe Leguillouii Ortman, *Die Decapodenkrebse des Strassburger Museums*, 1893—94, p. 432.

Though this rare species is not in the collection, a new description and a new figure may be welcome.

Two type-specimens of *Menippe Leguillouii* A. M. E. from the Paris Natural History Museum are lying before me; they are in a dry state, an adult female without eggs and a young male, collected by Leguillou in the »Mer des Indes» (A. Milne Edwards, l. c.). One of these specimens was sent by me to Prof. Hilgendorf at Berlin, who, together with Dr. Römer, compared it with the specimens

from the Coast of Mozambique that in 1878 were described by the former under the name of *Menippe Fornasinii*, and Dr. Römer thereupon informed me that it was identical with them. I therefore conclude that Bianconi's species and *Myomenippe Leguillouii* A. M. E. are indeed one and the same species.

Galene? hirtipes Jacq. and Lucas and *Myom. Leguillouii* A. M. E. are apparently identical, as both the description and the figures in the »Voyage au Pôle Sud» fully agree with the type specimens of the latter.

Ortmann refers to this species also Haswell's *Pararuppellia saricola* from the Eastern coast of Australia, which indeed appears quite probable. As also a specimen of *Myom. granulosa* A. M. E. from the Mergui-collection is lying before me, it will be easy to indicate the principal differences between the two species of *Myomenippe*.

As regards their outer appearance, the general shape of cephalothorax and legs, both species closely resemble one another. The front and the orbits show the same characters, fully agreeing in the number and the form of the teeth. Behind the outer angles of the orbits that are acute and dentiform, in both specimens four teeth are observed and in both the second is the largest of all. This second tooth, however, appears in *M. Fornasinii* slightly longer in proportion to the first than in *Myom. granulosa* A. M. E. In *M. granulosa* A. M. E. the distances between the tip of the second tooth and those of the third and first are about in proportion as 3:2, but in Bianconi's species as 5:3. The first and the second tooth are moreover less prominent in *M. Fornasinii*, the second tooth indeed is 8-times as long as high, but in *Myom. granulosa* 6-times: in other words the anterior margin of these teeth appears somewhat shorter in proportion to their length than in *Myom. granulosa* A. M. E. The margins of the antero-lateral teeth are finely granulate in *M. Fornasinii*, but in the other the granules are conical, more prominent and less numerous. The inter-

regional grooves are, at least on the anterior half of the upper surface, quite distinct and moderately deep in *M. granulosa*, but they are almost wanting in *M. Fornasinii*; the mesogastric furrow that bifurcates posteriorly, reaching, however, only till the middle of the gastric region, is faintly indicated and so also the lateral portions of the cervical suture, the grooves between the gastric region and the anterior branchial one, but other grooves are not to be seen. In *M. granulosa* the regions of the upper surface before the line that unites the antero-lateral teeth of the last pair with one another, are distinct and well-defined, more or less prominent and covered with coarse granules, but the interregional grooves and furrows are smooth; in *M. Fornasinii* on the contrary the regions are scarcely distinct, inconspicuous, and the whole upper surface of the cephalothorax appears smooth to the naked eye. Only when the carapace is examined under a strong magnifying glass, one observes a minute granulation near the antero-lateral and on the postero-lateral margins, on the frontal teeth, on the upper margin of the orbits and on the epigastric lobes. In both species, immediately behind the frontal teeth of the second pair, a small tubercle is present; this tubercle is less conspicuous, more rounded in the species described by Bianconi.

The general shape of the chelipedes is the same in both and even as regards the form and the toothing of the fingers, *M. Fornasinii* agrees with *M. granulosa*. These legs, however, are everywhere quite smooth in Bianconi's species, but conspicuously granulated in *M. granulosa*, as has been described in my Report on the Crustacea of the Mergui Archipelago. The chelae of *M. Fornasinii* appear, however, distinctly punctate to the naked eye; these puncta are more numerous and somewhat larger on the upper margin of the palm than on its convex outer surface and between them a much finer microscopical punctulation is moreover observed, when the legs are examined under a strong lens.

to dedicate to Dr. A. E. Ortmann of Princeton N. J., the author of so many important carcinological memoirs, bears such a striking resemblance to *Menippe Panope* Herbst from Tranquebar that I thought it necessary to send this specimen to Prof. Hilgendorf at Berlin, who kindly compared it with the type of Herbst, also a female, and then indicated to me the differences, so that this species, an inhabitant of freshwater, proved to be new to science. The cephalothorax has exactly the same width and length as the type of *Menippe Panope*, so that the new species is probably also one of small size and the general shape of the carapace is the same. Prof. Hilgendorf informed me that both species also agree with one another as regards the convexity and the outline of the cephalothorax. The greatest width, at the tips of the penultimate anterolateral teeth, is not yet once and a half as large as the length, measured in the middle. The cephalothorax is strongly convex fore and aft, somewhat less from side to side. Just behind the middle one observes the usual H-shaped figure, that is not formed by furrows as usual, but only by the absence of the minute granules with which the whole surface of the cephalothorax is covered. The regions are inconspicuous, not at all defined, for besides the H-shaped figure only the mesogastric furrow is to be observed, and even the lateral branches of the cervical groove, the boundary between the gastric and branchial regions, are completely wanting. A little before each anterior extremity of the H-shaped figure, I observed an impressed point, corresponding to the posterior extremity of the protogastric areae. An imaginary line that unites these two points, crosses the lateral margins about in the middle between the tips of the two posterior anterolateral teeth and the distance between this line and the frontal margin measures almost two thirds of the distance between it and the posterior margin of the cephalothorax. Just as in *Menippe Panope*, the two epigastric lobes are lying at some distance behind the free border of the front,

between the orbits; these lobes are declivous forward and towards the orbits and are separated from one another by the mesogastric furrow that, after bifurcating, extends only over the anterior fourth part of the cephalothorax. In *Menippe Panope*, however, the interregional grooves are well-defined, though Hilgendorf informs me that they are less conspicuous than in Herbst's figure. The whole upper surface of the cephalothorax shows, under the lens, an extremely fine and close microscopic granulation, but it appears smooth to the naked eye; only just near the penultimate antero-lateral teeth these minute granules are a little larger, though still only visible by means of a magnifying-glass. The anterior moiety of the cephalothorax of *Menippe Panope*, however, is covered anteriorly and on the antero-lateral regions with numerous red pearly granules at least twice as large as the microscopic granules described above and observed also on the species from Tranquebar. Such large granules are observed, in *Menippe Ortmanni*, only on the front, just behind the free border, so that they are already fully wanting on the epigastric lobes. On each side of the upper surface of the cephalothorax one observes six or seven impressed points, situated in a semicircular line, that runs from the impressed point described above, just before the ends of the H-shaped figure, to the extremity of the ridge of the last antero-lateral tooth. The upper surface is also somewhat pitted on the front, just behind the supra-orbital margin and near the antero-lateral border of the carapace.

The front is obliquely deflexed and as prominent as in *Menippe Panope*; it is cut by a rather deep triangular notch into two obtuse lobes. The granulated fore edge of these lobes shows at its outer angle a small obtuse tooth before passing into the supra-orbital margin, so that the front may be described as four-lobed; these small external teeth reach about as far forward as the inner lower angle of the orbits and form an obtuse angle

with the upper margin of the orbits; the distance between these two obtuse angles, i. e. the width of the front, measures a little less than a third of the greatest breadth of the cephalothorax.

The distance between the outer angles of the orbits is little more than half the greatest width; these angles are dentiform, but small and not very conspicuous. The finely granulated supra-orbital margin is tumid, well delimited from the carapace, with two distinct grooves near the outer angle. The orbits are almost circular, scarcely broader than high. Immediately below the outer angle there is a small triangular groove or gap; the lower margin of the orbits is concave in the middle and both its inner and its outer angle are dentiform, the former being larger and projecting more forward than the latter. This external lobe or angle of the infra-orbital margin (Fig. 2^a and 2^b) is a little larger than the extra-orbital angle and a little more prominent.

The fairly sharp, finely granular antero-lateral margin of the carapace is about as long as the postero-lateral and divided into four teeth, the first three of which are broad and anteriorly acuminate, the last narrow and carinated; these teeth are, however, lower and less prominent than in *Menippe Panope* Herbst, as Hilgendorf writes. The distance ($1\frac{1}{2}$ mm.) between the outer angle of the orbit and the tip of the first antero-lateral tooth measures three fourths the distance between the tips of the two first teeth and this latter measures two thirds of the distance between the tips of the second and third tooth; the tip of the third tooth finally is still slightly more distant from the fourth than from the antepenultimate. The four first teeth therefore, including the extra-orbital angle, gradually increase in length. The outer margin of the penultimate tooth runs backward and slightly inward, so that the cephalothorax presents its greatest width at the tips of these teeth; the last tooth is carinated above and the ridge that gradually diverges from the postero-

lateral border, is nearly as long as the outer margin of the penultimate tooth. Just as in *Menippe Panope*, the straight postero-lateral borders strongly converge backward, so that the slightly concave posterior margin of the cephalothorax is scarcely as wide as the front.

The basal joint of the external antennae is small and even slightly more distant from the front than it is itself long; the second, much smaller joint reaches scarcely the front and the third joint is narrower than the orbital hiatus; unfortunately the flagellum is broken, but it is certainly as long as the orbits are broad. The internal antennae (Fig. 2^b) are a little oblique, the epistome is short. The endostome is faintly ridged, the ridges being only distinct on its posterior part.

The external maxillipedes (Fig. 2^c) are covered everywhere with a close microscopic granulation and a few fine hairs are distributed over them; they have about the same form as those of *Menippe Rumphii* from the Indian Ocean.

The fore edge of the merus-joint is slightly convex, the antero-external angle is obtuse and the outer margin is somewhat concave.

The whole under surface of the carapace, between the lateral margins and the buccal frame, presents the same close microscopic granulation as the upper surface; the granules on the internal infra-orbital lobe are a little larger and near the lower border of the orbits the surface is somewhat pitted (Fig. 2^b).

The abdomen of the female is a little broader than that of *Menippe Panope*, it presents its greatest width at the penultimate joint and the terminal joint is semi-circular; the seven joints are quite smooth, though somewhat pitted near their lateral- and anterior margins.

The chelipedes differ from those of *Menippe Panope* especially by their different granulation. They are, as in Herbst's species, massive and unequal, the right being the larger. The strongly curved upper margin of the quite short arm of the right leg, which scarcely extends

beyond the lateral margin of the carapace, is rather sharp and unarmed; the anterior margin is less sharp and the lower border is rounded. The smooth inner surface of the large massive wrist fits close to the antero-lateral border of the cephalothorax and its inner angle is bluntly prominent. To the naked eye the upper and the outer surface of the wrist appear smooth and shining, but under a lens one observes just the same close microscopic granulation as on the surface of the carapace; in *Menippe Panope* Herbst, however, granules of large size, similar to those of the outer surface of the hands, are distributed over about three fourth parts of the convex upper surface of the wrist. Near the anterior margin, that articulates with the hand, the granules are a little larger. The upper surface of the wrist is moreover somewhat pitted. Hilgendorf writes me that the hand of the larger leg is one millimeter longer and a little lower than that of the type specimen of *Menippe Panope* Herbst, so that the shape of the hand is not exactly the same. The length measured horizontally is a little shorter than the greatest width of the cephalothorax and the hand is almost twice as long as high. The fingers are somewhat less than half as long as the whole hand, measured horizontally. The lower margin of the palm makes a straight line with that of the immobile finger.

According to a former information received from Prof. Hilgendorf, the granules on the middle of the outer surface of the hand are, in the species described by Herbst, $\frac{1}{2}$ mm. broad and distinctly larger than those of the upper and of the lower margin (confer: de Man, The Journal of the Linnean Soc. of London, V. 22, 1888, p. 43). In the specimen from Sanggau, on the contrary, the convex outer surface of the larger chela is covered with a not quite uniform granulation, distinctly visible, however, to the naked eye; this granulation is somewhat closer near the upper and near the lower margin of the palm than in the

middle of the outer surface. On the middle the granules have but a diameter of $\frac{1}{4}$ mm., near the upper margin and at the base of the immobile finger they are a little larger, being $\frac{1}{3}$ mm. broad. Under a lens I observe moreover a close microscopic granulation on the whole outer and inner surface of the palm, as also on the lower border on which the larger granules are absent.

The outer surface of the immobile finger shows a longitudinal furrow near the lower margin and a shorter one at the base of the teeth, and the granulation disappears gradually towards the obtuse tip (Fig. 2^d); this finger bears just in the middle a strong conical tooth, on either side of which two smaller teeth are observed. The strongly curved dactylus is granular at the base and bears two rows of impressed punctures; this finger is also bluntly pointed and is armed with 7 or 8 low, obtuse teeth. The left hand is considerably smaller, its horizontal length measures indeed only two third of the greatest breadth of the cephalothorax and this hand is a little more than twice as long as high. The fingers are almost as long as the palm and more sharply pointed at their tips. The immobile finger carries five incisiform teeth that gradually decrease in size, the dactylus is less curved, distinctly grooved and its teeth are also incisiform, but lower than those of the index. The outer surface of the palm is rather uniformly covered with granules, all of about the same size, $\frac{1}{4}$ mm. broad, and between these granules one observes under a lens the microscopic granulation. The lower border of this hand is a little concave in the middle. The wrist and the arm agree with those of the other leg, also with regard to the granulation.

The short ambulatory legs resemble those of *Menippe Panope*. Their joints are smooth on the outer surface, only a little punctate, but their anterior margin is finely granular; the margins are a little hairy, mostly those of the terminal joints that end into sharp horny claws.

The fingers of the chelipedes are dark brown, excepted at the base, with white tips. The cephalothorax, preserved in alcohol, has a light yellowish brown hue, without a trace of the small red spots with which *Menippe Panope* is mottled.

Menippe conveva Rathb., from Honolulu, seems to be a closely allied species, but the anterior portion of the mesogastric region is defined and the median lobes of the front are small, separated by a shallow groove, characters not observed in *Menippe Ortmanni*. The habitat is moreover quite different.

Measurements in millimeters:

Greatest breadth of the cephalothorax	19 $\frac{1}{2}$
Length in the median line of the carapace	14
Thickness of the cephalothorax	9 $\frac{1}{2}$
Distance between the internal orbital angles	5 $\frac{2}{3}$
" " " external " "	10 $\frac{1}{3}$
Breadth of the posterior margin	5
Breadth of the orbits	2 $\frac{1}{7}$
Height " " "	2
Horizontal length of the larger chela	17
" " " " fingers	7
Height of the larger chela	9
Horizontal length of the smaller hand	12 $\frac{1}{2}$
" " " " fingers	6
Height of this hand	6

Genus *Potamon* Sav.

Subgenus *Parathelphusa* H. M. E.

Potamon (Parathelphusa) tridentatum H. M. E.

(Plate 5, fig. 3).

Parathelphusa tridentata H. Milne Edwards, in: Archives du Muséum, Tome VII, p. 171, pl. 13, fig. 1. — von Martens in: Archiv für Naturgeschichte, Jahrg. 34, 1868, p. 19. — de Man, in: Notes from the Leyden Museum, Vol. I, 1879, p. 61.

15 specimens were collected, viz.:

1 female at Sanggau.

Notes from the Leyden Museum, Vol. XXI.

6 specimens (2 ♂♂, 4 ♀♀) without definite locality though probably from Sintang.

2 males and 1 female from the southern foot of Mount Kenepai, collected in December 1893.

2 young males from Nanga Raoen.

2 young males from the forest near the small Siniai river, captured in March 1894, and finally

1 young female collected by Dr. Nieuwenhuis at Bloe-oe, a locality situated on the Upper Mahakkam.

Not one of all these specimens may be considered to have attained its full growth: the cephalothorax of the largest individual, a male from Mount Kenepai, is 49 mm. broad, but the female from the Solor-Islands, that has been mentioned in my paper quoted above, was 70 mm. broad. The proportion between the width and the length of the cephalothorax appears to be somewhat variable in this species. In the specimen figured by Milne Edwards (l. c.) the proportion is as 23:19. Just the same proportion is shown by the female from Sanggau and by a younger female from Buitenzorg, Java, in my own collection: in both the form of the carapace fully agrees with the figure in the »Archives du Muséum." In all the other specimens, however, the cephalothorax appears a little broader, the proportion between width and length being as 23:18. In the old female from the Solor-Islands the cephalothorax was 70 mm. wide and 52 mm. long, the proportion between both therefore as 23:17, but this may be a consequence of the large size of this specimen.

Almost in all those individuals in which the proportion between width and length of the cephalothorax is as 23:18, the tip of the first epibranchial tooth is a little less distant from the external orbital angle than from the tip of the second epibranchial tooth, that seems to be usually the case in this species (de Man, l. c. p. 64); in the female from Sanggau, however, as also in that from Buitenzorg, the cephalothorax of which specimens is less enlarged, the distance between the tips of the two epi-

branchial teeth appears a little shorter than the distance between the tip of the first epibranchial tooth and the outer angle of the orbits. I presume that these both characters coincide.

Von Martens (l. c.) says that in his specimens from Borneo the extra-orbital tooth presented a »zwar abgerundeten und stumpfen, aber doch deutlich begrenzten Vorsprung», that he considered as homologous to the first epibranchial tooth of *Parathelphusa sinensis*. In the specimens now lying before me no trace of such a prominence is perceptible.

According to the same author the penultimate segment of the male abdomen should be about once and a half as long as broad, but in the present specimens it is but slightly longer than broad. In the older specimens the lateral margins of that segment show a small blunt prominence (Fig. 3), so that it appears here broadest; behind these prominences the lateral margins run parallel with one another. In the largest male, that from Mount Kenepai, the penultimate segment (Fig. 3) appears at the two prominences only for one ninth part, and behind them for one sixth less broad than it is long.

In two specimens without definite locality, viz. in the male specimen N^o 4, measured below, and in a female, the ambulatory legs are a little more slender as is ordinarily the case: this species therefore varies also in this character.

Cephalothorax and legs of most specimens have a dark olive-green colour, sometimes with a reddish hue, as especially in the female from Sanggan; the fingers are darker, often blackish with reddish yellow tips.

Measurements in millimeters:

	1	2	3	4	5	6	7	8.
	♂	♀	♀	♂	♀	♂	♂	♀
Greatest width at the tips of the last epibranchial teeth.	48½	46	39¼	42	39¼	33	24½	32
Length of the carapace, the abdomen excluded.	38	37	32	33	31¼	26	19	26

Notes from the Leyden Museum, Vol. XXI.

Measurements in millimeters:

	1	2	3	4	5	6	7	8.
Length of the penultimate segment of the abdomen	9			$7\frac{3}{5}$		6	$4\frac{1}{2}$	
Breadth of the anterior margin of this segment	$6\frac{1}{2}$			$5\frac{1}{2}$		5	$4\frac{1}{7}$	
Breadth at the two prominences.	8			$6\frac{1}{2}$		$5\frac{2}{3}$	$4\frac{2}{3}$	
Breadth just behind the middle	$7\frac{2}{3}$			6		$5\frac{3}{5}$	$5\frac{1}{5}$	
Breadth of the posterior margin.	8			$6\frac{1}{2}$		$5\frac{6}{5}$	$5\frac{1}{2}$	
Length of the meropodites of the penultimate legs	21	20	$18\frac{1}{2}$	20	17	$15\frac{1}{2}$	11	14
Breadth of the meropodites of these legs	$6\frac{1}{5}$	6	$5\frac{1}{5}$	$5\frac{1}{3}$	$5\frac{1}{3}$	$4\frac{1}{5}$	$3\frac{1}{5}$	$4\frac{2}{5}$

Nos 1 and 2 Mount Kenepai, N^o 3 Sanggau, Nos 4 and 5 without definite locality, Nos 6 and 7 Siniai River, N^o 8 Java, Buitenzorg.

Parathelphusa tridentata has been recorded from Sumatra: Lahat (v. Mart.); Java (v. Mart., Heller, de Man, Ortm.): Soerabaya (v. Mart.), Buitenzorg (de M., Ortm.); Borneo: Singkawang (v. Mart.); Timor, Bavian Islands, Solor Islands (de M.).

Perithelphusa, n. subg.

I propose this new subgenus for *Potamon borneense* v. Mart. and two new species described in this Report. It is characterized by the existence of one single, well-developed, acute, spiniform epibranchial tooth, and by the post-frontal ridge being as little developed as in the subgenus *Geothelphusa*. In these three species the male abdomen has the same form, its sides converging from the base of the third to the apex of the fifth segment, thence to its extremity narrow. The meropodites of the chelipedes bear a sharp spine on their superior margin, just behind the distal extremity; the lower surface of these joints is smooth, without a tubercle near the carpal articulation and having the margins entire, not tubercular.

This new subgenus forms a remarkable transition to

the subgenera *Parathelphusa* and *Geothelphusa*. It differs from the former by the existence of only one single epibranchial spine and by the absence of a postfrontal ridge, for in *Parath. spinigera* White, the only form with one epibranchial tooth, the lateral portions of the postfrontal crest are well-developed and sharp. *Perithelphusa* may be distinguished from *Geothelphusa* by the well-developed epibranchial spine and by the existence of a spiniform tooth on the upper angle of the arms of the anterior legs.

Potamon (Perithelphusa) borneensis v. Mart. var.
hilaris n.

(Plate 5, fig. 4).

Thelphusa borneensis von Martens, in: Archiv für Naturgeschichte, 34 Jahrg., 1868, p. 18.

Five specimens (3 ♂♂, 2 ♀♀) were collected by Max Moret at Sintang.

The two females, though adult, carry no eggs.

This interesting species bears some general resemblance to *Parath. spinigera* White from Calcutta, but differs by the absence of the postfrontal ridge. It appeared to me probable that either this species or one of the two following might belong to *Potamon borneense* v. Mart., and therefore one male specimen of each was sent to Prof. Hilgendorf at Berlin, who, after a close examination, wrote me the following about the species which I go to describe: »Diese Form kann zur Noth mit *T. borneensis* zusammengebracht werden. Ich würde aber doch jedenfalls eine Varietät daraus machen". The individuals described by von Martens have been collected near Seminis in the Sampasbasin and at Lempai near the lake of Danau Sriaug, in the Upper-Kapoeas-basin, in the same region therefore as our specimens. The specimen sent to Berlin, was the male N° 2.

Our specimens are of a larger size than those of von Martens, the cephalothorax of the largest individual

is one third broader than that described in the »Archiv für Naturgeschichte". As is proved by the measurements, the proportion between the greatest width and the length of the cephalothorax is somewhat variable in our specimens, but in all these the cephalothorax appears, however, slightly more enlarged than in the type with which our specimen was compared. The carapace is little enlarged, the greatest width is in proportion to the length as 4:3 and is observed just behind the epibranchial teeth, on the limit of the foremost third of the upper surface. The upper surface is somewhat convex from before backwards, less so, although still distinctly, from side to side. The mesial crescentic portion of the cervical groove is distinct and moderately deep, excepted just in the middle, but the lateral portions are interrupted (Fig. 4); the median part of the semicircular groove is just twice as far distant from the free border of the front as from the posterior margin of the carapace. The anterior lateral portions between the gastric region and the anterior branchial one are two rather deep, oblique furrows, that in the adult end about 4 mm. short of the notch that bounds the epibranchial tooth anteriorly. A post-frontal crest cannot be said to exist as it is only represented by the wrinkled and rugose slope, with which the gastric region subsides towards the front and the post-orbital furrow. The epigastric portion, however, is more or less distinct and slightly bent forwards; the mesogastric furrow is linear, very narrow and shallow, not continued on to the front nor backwards and not bifurcating, so that the anterior extremity of the mesogastric area, in other species well-defined, is not at all distinct.

The anterior branchial region is moderately swollen, scarcely marked off from the posterior one; shallow depressions separate the posterior branchial and the cardiac regions from the intestinal, but the cardiac region is scarcely limited off laterally. The small, somewhat wrinkled

urogastric areolets are not contiguous, but separated from one another by an interspace almost as broad as the areolets themselves.

The upper surface of the carapace appears under a lens very finely punctate, the punctation is rather close, somewhat less so on the cardiac and mesogastric areas than elsewhere; on the front and behind the orbits the puncta are coarser. The gastric region is quite anteriorly, as well on the epigastric lobes as on the slope towards the post-orbital furrow, distinctly wrinkled and foveate. The lateral margin of the cephalothorax is covered, from the epibranchial tooth till the posterior margin, with oblique raised lines and is posteriorly slightly concave. For the rest the surface of the cephalothorax appears smooth and shining to the naked eye.

The front is obliquely deflexed, the anterior border is straight in the middle, or, as in the youngest male and in the youngest female, very slightly concave. In the type described by von Martens the free border is a little curved upward, so that the upper surface of the front appears slightly concave; this is also the case in the youngest male, but in the other specimens not or scarcely so. The free border curves into the very oblique inner somewhat raised portions of the upper orbital margins, or the frontal angles are at least very obtuse and rounded; the frontal margin measures about one fourth the greatest width of the cephalothorax, — it is somewhat difficult to measure exactly its breadth, — according to von Martens, however, one third. The distance between the free border of the front, near its outer angles, and the epigastric lobes is scarcely half as long as the former is broad. The front appears considerably broader at its base than at its free border.

The external orbital angles are moderately sharp and reach as far or almost as far forwards as the free border of the front, but not beyond it; the distance between them measures three fourth or little more than

three fourth the length of the cephalothorax. The outer margin of the extraorbital tooth makes a right angle with the upper margin of the orbits. The epibranchial tooth or spine, directed straightly forward or slightly inward, is, as in *Parath. spinigera*, widely distant from the external orbital angle, the distance between the latter and the tip of the epibranchial spine measuring about one fourth the whole length of the lateral margin. The base of the epibranchial tooth is about as far distant from the outer angle of the orbits as the epistome is broad, but in the type of von Martens the epistome is somewhat broader than that distance.

The epibranchial spine is strong, acute and salient, has a black point and is bounded anteriorly by a deep notch. The slightly sinuous outer margin of the extraorbital tooth makes with that notch an obtuse rounded angle, but in the type described by von Martens this angle is less distinctly marked on one side, faintly so on the other, the margin curving more regularly towards the base of the tooth. The posterior margin of the cephalothorax which is a little concave is, in the adult, almost twice as broad as the free border of the front, in the younger specimens somewhat shorter.

The small orbits (Fig. 4^a) are almost transverse, they are once and a half as broad as high and their width measures two thirds of that of the frontal margin. The outer margin of the extraorbital teeth, the upper and the lower margin of the orbits and the free border of the front are smooth, entire. The somewhat sinuous infraorbital margin has no hiatus near the outer angle and the obtuse inner angle is small, little prominent; the interspace between this angle and the front is wide. According to Hilgendorf the cornea of the eye-peduncles should be slightly larger and the distance between the free border of the front and the posterior margin of the epistome somewhat shorter than in the Berlin type: in the adult specimens this distance is half as long as the free border

of the front is broad. The anterior margin of the epistome, the surface of which is smooth, is as far distant from the frontal margin as from the tip of the triangular process that the posterior margin of the epistome sends backwards and downwards; on either side of this median tooth, the smooth posterior margin shows still another smaller, less prominent tooth, so that it is twice notched on each side.

The subhepatic area is limited off from the branchial floor by a finely granular transverse line and both regions are beset with oblique raised lines or rugae, that are also finely granular and as usual reach to the postero-lateral margins. The groove between the hepatic region and the branchiostegite is rather deep, especially anteriorly; one observes on the latter, near that groove, a few oblique rugations, but it is for the rest smooth.

The ischium-joint of the outer foot-jaws appears finely punctate under a magnifying glass, the longitudinal furrow on it is deep and runs close to and parallel with the inner margin. The merus-joint is somewhat broader than long, its antero-external angle is obtusely rounded; this joint appears also punctate under the lens and somewhat rugose at its postero-external angle, the punctation, however, is in some individuals rather indistinct.

The sternum and the abdomen of the male are smooth, though appearing finely punctate under a lens. There is at the anterior extremity of the sternum, between the posterior margins of the maxillipedes, a transverse furrow or impression, but there are no ridges on the sternum near the insertion of the chelipedes. In this species the distance between the anterior extremity of the ischial furrow and the outer margin of the ischium-joint appears a little broader than the distance between the anterior extremity of the abdominal cavity and the posterior margin of the buccal frame. Prof. Hilgendorf made me acquainted with this character.

The male abdomen bears some resemblance to that of *Potamon* (*Geothelphusa*) *loxophthalmum* de M. (de Man, in:

Notes from the Leyden Museum, 1892, pl. 9, fig. 3 c). The terminal joint is obtusely rounded and the sides are slightly concave. The sixth segment is a little longer than the seventh, the straight anterior margin is just as broad as the concave posterior one and measures little more than two thirds of the length of the joint, so that the latter is almost once and a half as long as broad. Just behind the anterior margin, the sides of this segment slightly bulge out laterally, so that it shows here its greatest breadth and in the type of Berlin the sixth joint is very slightly shorter than in our specimens. The antepenultimate joint is a little more than half as long as the sixth and exactly half as long as the posterior margin of it is broad. The closely punctate abdomen of the female has the usual form, the posterior border of the terminal joint is $2\frac{1}{2}$ times as broad as this joint is long.

The chelipedes are greatly unequal in the males, but subequal in the female (the younger female has lost all its legs) and in all the right leg is the larger. The arms project but little beyond the lateral margin of the cephalothorax. The upper edge is rugose and bears, just behind the constriction at its distal end, a sharp spine as usual in this subgenus; in the type examined by Hilgendorf it appears less slender, but it is probably worn off, as is also the case on the larger chelipede of the youngest male. The outer surface is covered with transverse rugosities, but the lower is smooth and bears no tooth or spine near the anterior margin; the anterior and the ventral angle are not rounded off, as is the case in *Parath. spinigera*. The upper surface of the carpopodites is faintly rugose and appears finely punctate under a lens; these joints are armed with a single stout spine at the inner angle. In the adult male the larger chela, measured horizontally, is just as long as the cephalothorax is broad, but in the younger males one fourth shorter. The fingers, measured horizontally, are as long as, but never shorter than the palm, that is almost just as

high as long. The lower margin of the palm is convex and makes thus no straight line with the index. The convex outer surface of the palm is covered with extremely shallow, small depressions or foveae, giving it a reticulate appearance and the interspaces between them show, under a magnifying glass, a minute granulation; one observes under a lens also a fine punctulation, more distinctly in the younger males than in the adult. The slightly compressed fingers are moderately slender and leave, in the adult, a narrow interspace between them when closed; they are covered, from their base until the pointed extremities, with an extremely fine and close granulation, hardly visible to the naked eye. The fingers are not at all grooved, the fine puncta, however, are arranged more or less distinctly in longitudinal rows. The dactylus is somewhat curved and both fingers are multidentate; the immobile finger (Fig. 4^d) is armed with about 20 small conical and unequal teeth of which the fifth and the eighth are somewhat larger and more prominent than the others. The teeth of the dactylus are a little smaller, also unequal, one in the middle is larger than the rest.

The smaller chela of the adult male is, horizontally measured, just as long as the cephalothorax and twice and a half as long as high; the fingers are a little longer than the palm, in contact throughout their length and the dactylus is less curved. In its other characters this hand agrees with the other.

Unfortunately in the adult female the immobile finger of the right hand, that is but very slightly larger than the other, is broken off and in the other female all legs are lost. The hands are much smaller than in the male, the horizontal length of the right chela measures three fourth the length of the carapace, the other is only 2 mm. shorter; the fingers of the right hand are about as long as the palm, in the other they are slightly longer. The teeth are smaller, but for the rest they resemble the hands of the male.

In the type of *Pot. borneense* in the Berlin Museum

the larger chela is less stout and palm and fingers are less high than in our specimens, but the type has a smaller size, as was already observed. The ambulatory legs are of moderate length, so e. g. those of the penultimate pair of the adult male are 60 mm. long, i. e. almost once and a half as long as the cephalothorax is broad; the meropodites are nearly three times as long as broad, their outer surface is granular, their upper margin is rugose and provided near the distal end with a sharp spine. The propodites of the penultimate legs are in the middle scarcely half as broad as long and in the adult the dactylopodites are somewhat longer. The ambulatory legs are glabrous. In the type these legs appear, as Prof. Hilgendorf wrote to me, a little more slender. The cephalothorax of our specimens preserved in alcohol, has above an olive-green or yellowish-green colour and is mottled with innumerable small red spots, the fronto-orbital margin and the epibranchial tooth are yellow. The chelipedes and the other legs present above the same green colour and spots, but on the chelipedes the latter are a little larger than on the carapace. The lower surface of the latter and of the legs is yellow and devoid of spots. In the type specimen at Berlin the small red spots are completely wanting.

Parathelphusa spinigera White (Confer: Wood-Mason, in: Journal Asiatic Soc. of Bengal, Vol. XL, Pt. II, 1871, p. 194, Pl. XII, Figs. 1—4) bears some resemblance to *Potamon borneense*, but is certainly different. I studied two specimens of that species during my last visit to the British Natural History Museum in 1896. The cephalothorax is more enlarged, that of an adult male from Calcutta is 59 mm. broad and only 39 mm. long. The post-frontal ridge is better defined, its lateral portions especially are cristiform and sharp; the free border of the front is slightly concave. The male abdomen has a different form, the penultimate or sixth joint is more quadrate, for in the adult male from Calcutta, that I examined, it is $8\frac{1}{4}$ mm.

Notes from the Leyden Museum, Vol. XXI.

long and the anterior and the posterior margins are respectively $6\frac{1}{2}$ mm. and $7\frac{3}{4}$ mm. broad. The immobile finger of the larger chela has a different shape, being higher at the base and the meropodites of the ambulatory legs bear no spine near the distal end of their upper margin.

Measurements in mm.:

Greatest width of the cephalothorax.	41	$35\frac{1}{2}$	$34\frac{1}{3}$	$40\frac{1}{3}$	$36\frac{1}{2}$
Length " " "	32	$27\frac{1}{2}$	$25\frac{1}{2}$	31	29
Distance between the outer orbital angles.	$24\frac{1}{2}$	$22\frac{1}{2}$	21	$24\frac{1}{2}$	$21\frac{1}{2}$
Distance between the tips of the epibranchial teeth	$39\frac{1}{2}$	34	$31\frac{1}{2}$	$38\frac{1}{2}$	$34\frac{1}{2}$
Distance between the tip of the epibranchial tooth and the external orbital angle	9	$7\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{2}{3}$	$7\frac{1}{2}$
Breadth of the free border of the front.	10	9	$8\frac{1}{2}$	10	9
Distance between the free border of the front near its outer angles and the epigastric lobes	$4\frac{1}{2}$	4	$3\frac{1}{2}$	4	4
Distance between the frontal margin and the posterior boundary of the gastric region	$20\frac{1}{2}$	18	$16\frac{1}{2}$	20	18
Width of the posterior margin of the carapace	18	$15\frac{1}{2}$	$14\frac{1}{2}$	$18\frac{1}{2}$	17
Width of the orbits	$6\frac{1}{2}$	6	$5\frac{1}{2}$	$6\frac{1}{2}$	6
Height " " "	$4\frac{1}{2}$	4	$3\frac{1}{2}$	$4\frac{1}{2}$	4
Distance between the free border of the front and the tip of the median tooth of the epistome	5	4	4	5	5
Length of the terminal joint of the abdomen	6	$5\frac{1}{2}$	5		
Length of the penultimate joint	7	$6\frac{1}{2}$	$5\frac{1}{2}$		
Breadth of the anterior margin of this joint	5	$4\frac{1}{2}$	$4\frac{1}{4}$		
Breadth of the posterior margin	5	$4\frac{1}{2}$	4		
Horizontal length of the larger hand	39	27	26	24	
" " " " fingers	$19\frac{1}{2}$	$13\frac{1}{2}$	$13\frac{1}{2}$	12	
Height at the articulation of the fingers.	18	$12\frac{1}{2}$	$12\frac{1}{2}$		
Length of the meropodites	$18\frac{1}{2}$	$16\frac{1}{2}$	$15\frac{1}{2}$	15	
Breadth " " "	$6\frac{1}{2}$	6	$5\frac{1}{2}$	5	
Length of the propodites, in the middle.	10	$9\frac{1}{2}$	9	8	
Breadth of the propodites, in the middle	$4\frac{1}{2}$	4	$3\frac{2}{4}$	$3\frac{1}{2}$	
Length of the dactylopodites	$13\frac{1}{2}$		$8\frac{1}{2}$	$10\frac{1}{2}$	

Wanting.

Wanting.

Potamon (Perithelphusa) Büttikoferi, n. sp.

(Plate 6, fig. 5).

Four males of different size from Sintang, collected by Max Moret.

This new species bears some resemblance to the preceding one: the meropodites of the ambulatory legs present a spine on their anterior margin and the upper angle of the arm of the chelipedes also, the abdomen has about the same form and as regards the postfrontal ridge, as little defined, both species agree with one another. Therefore this species, that I have the pleasure to dedicate to the Zoologist of the Expedition, may be likewise referred to *Perithelphusa*. The second male has been compared by Prof. Hilgendorf with the type of *Potamon borneense* v. Mart. and he wrote me that he considered this species to be new.

As in *Pot. borneense* v. Mart. var. *hilaris*, the greatest width of the cephalothorax is in proportion to its length as 4:3, but the distance between the epibranchial teeth and also that between the outer orbital angles are in proportion to the greatest width a little shorter and as the lateral margins have a different form and direction, the cephalothorax of both species presents a different shape and figure.

As regards the convexity of the carapace, as well from end to end as from side to side, both species almost agree with one another; in the largest specimen the gastric region appears slightly less convex transversely but this may be an individual difference. Concerning the little development or rather absence of a post-frontal ridge, both also agree with one another; it is only indicated by the slope, by means of which the gastric region subsides towards the front and towards the post-frontal furrow. The epigastric lobes are slightly advanced, wrinkled anteriorly, not limited off posteriorly, but continuous with the gastric

region; the declivous lateral parts are coarsely punctate, scarcely wrinkled. The cervical groove is interrupted, just as in the preceding species and in both equally far distant from the anterior margin of the front; the posterior, median, crescentic portion is deep, the anterior portions are just as deep as in *Pot. borneense* var. *hilaris*, but their direction is less oblique: these furrows, indeed, when continued backwards would form a right angle with one another in the preceding species, but an acute one in *Potamon Büttikoferi*. The gastric region is not subdivided and even the anterior prolongation of the mesogastric area is not defined, the mesogastric furrow being short and not bifurcating; the antero-external parts of the gastric region appear, in the adult, somewhat wrinkled, the ramifying wrinkles diverge from the anterior branches of the cervical groove, in the younger individuals these wrinkles are less conspicuous. The urogastric areolets agree with those of *Pot. borneense*, and shallow depressions separate the anterior branchial lobe from the posterior one, that is considerably smaller, and the latter from the cardiac region.

The front presents distinctly a broad, shallow bay that extends till the rounded lateral angles, which pass with a curve into the upper margin of the orbits, so that it is here also somewhat difficult to measure exactly the breadth of the free border of the front: it is about one fourth the greatest width of the carapace. The somewhat raised lateral margins of the front are slightly less oblique than in *Pot. borneense* var. *hilaris*, so that the front appears at the base a little less broad in proportion to the width of the frontal anterior margin. Just before the foveate epigastric lobes the surface of the front is marked with a few transverse rugosities, but for the rest it is coarsely punctate. The supra-orbital margins are sinuous and form almost right angles with the outer margin of the extraorbital tooth; the outer angles of the orbits are moderately sharp and reach almost as far forward as the

free border of the front. The epibranchial teeth are widely distant from the external orbital angle, though the distance between the latter and the tip of the epibranchial tooth is a little shorter than in the preceding species, measuring in the adult male one sixth the length of the whole lateral margin. The outer border of the extraorbital tooth is in most specimens almost straight, with no obtuse angle in front of the notch that separates it from the epibranchial tooth; the third male, the carapace of which is $30\frac{1}{2}$ mm. broad, resembles, however, in the form of this outer border, *Pot. borneense* var. *hilaris*. The epibranchial tooth is acute, with a brown point, directed forward and slightly inwards, but these teeth are somewhat smaller than in the other species. Otherwise as in the latter, in which the distance between the epibranchial teeth is almost as large as the greatest width of the cephalothorax, the lateral margin runs, behind the epibranchial tooth, obliquely outwards so that the branchial lobe bulges out laterally with a convex outer margin; the greatest width of the cephalothorax is situated along a line dividing the anterior from the middle third of the upper surface. The oblique raised lines on the slightly concave postero-lateral margins are a little less numerous but more salient than those of the variety *hilaris* of the preceding species. The whole upper surface is finely and closely punctate, on the cardiac and mesogastric areas the minute puncta are less numerous. The posterior margin of the cephalothorax is, at least in the adult male, a little less broad with regard to the greatest width of the cephalothorax than in *Pot. borneense* var. *hilaris*.

The orbits are small, slightly oblique in a front view and little broader than high; in a front view the sinuous course of the upper margin is well visible, the lower margin is regularly curved, without a notch or hiatus near the outer angle and the obtuse inner angle is very small, scarcely prominent and widely distant from the front.

The nasal plate is somewhat broader, but less

high than in the preceding species, the epistome has about the same form, but the median tooth is obtuse. As in that species the subhepatic region is limited off from the branchial floor by a distinct transverse furrow and with regard to the wrinkles and rugosities on the lower surface of the cephalothorax both species agree.

The ischial line of the external maxillipedes has the same situation and direction as in the preceding form and also with regard to their other characters the outer foot-jaws agree, but the merus-joint is slightly less enlarged with regularly rounded anterolateral angle.

In the male of *Pot. borneense* var. *hilaris* the abdominal cavity reaches as far forwards as a line uniting the outer angles of the buccal frame and there are no impressions or only very slight ones between these angles and the end of the cavity; in *Pot. Büttikoferi*, however, the cavity reaches not so far forwards and the sternum bears, just before its extremity, a rather deep transverse furrow between the outer angles of the buccal frame, in front of which one sees, in the angle of the sternum, the same transverse groove that also exists in *Pot. borneense* var. *hilaris*, and equally there are no ridges near the insertion of the chelipedes. The distance between the anterior end of the ischial line of the external maxillipedes and the external margin of the ischium is a little shorter than that between the anterior extremity of the abdominal cavity and the oblique posterior margins of the buccal frame, in *Pot. borneense* var. *hilaris*, however, a little broader. The sternum is smooth, punctate. The male abdomen has the same form as in the preceding species, but the penultimate segment is comparatively shorter, being but very slightly longer than the terminal; the lateral margins have the same form and direction in both and the punctation is the same.

The chelipedes are very unequal, in the largest male the left is the larger, in the others the right. The meri project as little beyond the carapace as in *Pot. borneense*,

the upper margin carries a rather small spine or tooth, that is acute in the two youngest individuals, but worn off in the two others. For the rest the meri resemble those of *Pot. borneense*, the angles of the flattened lower surface being moderately sharp, not rounded and this surface presenting no trace of a spine or tubercle. The wrist carries above oblique rugosities and wrinkles and is armed at the inner angle with a rather short, but stout spine. In the largest specimen the large chela is almost as long, measured horizontally, as the cephalothorax is broad, in the others it is comparatively shorter, so that in the youngest individual it measures only two thirds of the greatest width. In the adult male the somewhat compressed fingers that leave an interspace between them, when closed, meeting only at the pointed tips, are almost once and a half as long as the palm; they have about the same height, in *Pot. borneense* var. *hilaris*, however, the index is higher at the base than the dactylus. This finger is armed near the articulation with a strong tooth, that bears a few smaller ones and between this tooth and the extremity 9 or 10 very small teeth are observed. The somewhat curved dactylus carries in the middle a conical tooth, much smaller than the strong tooth of the immobile finger and a few very small teeth stand on either side of it. The fingers are smooth, punctate, on the middle the puncta form a longitudinal row. The convex palm is, at the articulation of the fingers, a little higher than it is long, measured horizontally; it appears smooth to the naked eye, but presents under a lens the same structure as the palm of the larger hand of the preceding species. The lower margin of this chela is slightly concave in the middle.

In the younger males the fingers are as long as the palm, that is about as high at the articulation of the fingers as it is long; the fingers are almost in contact with one another, the toothing is about the same as in the adult. The longitudinal rows of puncta are still more distinct, so

that the fingers appear faintly grooved. Under a strong lens a similar close and fine granulation is shown by *Pot. borneense* var. *hilaris*, the palm presenting fine reticulating lines that are minutely granular.

The smaller hand of the adult male measures scarcely three fourth the width of the cephalothorax, the fingers are but little longer than the palm and almost in contact with one another. In the younger specimens the smaller chela is still shorter, so in the youngest male it is little more than half as long as the cephalothorax is broad.

The ambulatory legs are comparatively as long as in the preceding species and are also quite glabrous, but they are more slender. So e. g. the legs of the penultimate pair are almost once and a half as long as the cephalothorax is broad, measuring 56 mm. in the adult male. The upper margin of the meropodites terminates into an acute tooth and the outer surface is granular, excepted those of the last pair; they are slender, so e. g. those of the penultimate pair are a little more than 3 times as long as broad, the propodites are $2\frac{1}{2}$ -times as long as broad, in the middle, and the stout terminal joints are somewhat longer than the propodites. The upper surface of carapace and legs is mottled with similar small spots of a red colour as in *Pot. borneense* var. *hilaris*.

Measurements in millimetres:

	1	2	3	4
Greatest width of the cephalothorax.	39	33	$30\frac{1}{2}$	22
Length " " "	$28\frac{1}{2}$	25	23	17
Distance between the external orbital angles. . .	$21\frac{1}{2}$	$19\frac{1}{2}$	$18\frac{1}{2}$	14
" " the tips of the epibranchial teeth.	32	$28\frac{1}{2}$	26	$19\frac{1}{2}$
" " the tip of the epibranchial tooth and the external orbital angle.	6	$5\frac{1}{3}$	$4\frac{1}{3}$	$3\frac{1}{3}$
Breadth of the free border of the front	9	8	$7\frac{1}{2}$	6
Distance between the free border of the front near its outer angles and the epigastric lobes . . .	$3\frac{1}{2}$	3	3	$2\frac{1}{4}$
Distance between the free border of the front and the posterior boundary of the gastric region. .	18	$15\frac{1}{2}$	$14\frac{1}{2}$	11
Width of the posterior margin of the cephalothorax.	15	14	$12\frac{1}{2}$	10
Width of the orbits	6	$5\frac{1}{3}$	5	4
Height " " "	$4\frac{1}{2}$	4	$3\frac{1}{2}$	$2\frac{3}{4}$

	1	2	3	4
Distance between the anterior frontal margin and the tip of the median tooth of the epistome.	$3\frac{2}{7}$	$3\frac{1}{2}$	$3\frac{1}{4}$	$2\frac{1}{3}$
Length of the terminal segment of the male abdomen.	$5\frac{1}{2}$	$4\frac{2}{3}$	$4\frac{1}{4}$	$3\frac{1}{4}$
Length of the penultimate segment	$5\frac{1}{2}$	5	$4\frac{2}{3}$	$3\frac{1}{2}$
Breadth of the anterior margin of this segment.	5	$4\frac{1}{4}$	4	$3\frac{1}{4}$
" " " posterior " " " " " " "	5	4	4	$3\frac{2}{5}$
Horizontal length of the larger chela	$36\frac{1}{2}$	26	23	$14\frac{1}{2}$
" " " " fingers	$21\frac{1}{2}$	$13\frac{1}{2}$	$11\frac{1}{2}$	$7\frac{1}{2}$
Height of the hand at the articulation of the fingers.	$17\frac{1}{2}$	$12\frac{1}{2}$	$11\frac{1}{2}$	$6\frac{1}{2}$
Length of the meropodites	$18\frac{1}{2}$	16	15	$11\frac{1}{2}$
Breadth " " " " " " " " " " " "	$5\frac{1}{2}$	5	$4\frac{3}{4}$	$3\frac{1}{2}$
Length of the propodites in the middle	$10\frac{1}{2}$	$9\frac{1}{5}$	$8\frac{3}{4}$	$6\frac{1}{2}$
Breadth " " " " " " " " " " " "	4	$3\frac{2}{3}$	$3\frac{1}{2}$	$2\frac{1}{2}$
Length of the dactylopodites	12	$10\frac{1}{2}$	$9\frac{1}{2}$	$7\frac{1}{5}$

Potamon (Perithelphusa) silvicola, n. sp.

(Plate 7, Fig. 6).

Four males about of the same size and two younger females without eggs, were collected in March and May 1894 in a forest near Nanga Raen and in the following month one quite young male was captured at Poetoes Sibau.

This species is closely allied to *Pot. borneense* v. Mart. and its variety *hilaris*, and bears a great resemblance to them, but it differs more from *Pot. Büttikoferi*, at first sight by the different general outer appearance. It may be distinguished from the first named species and its variety especially 1° by the cephalothorax being a little longer in proportion to its greatest width, 2° by the different shape and length of the extraorbital teeth.

The third specimen, the carapace of which is $32\frac{1}{2}$ mm. broad, was sent to Prof. Hilgendorf at Berlin, who compared it with the type of *Pot. borneense* v. Mart. and then wrote me the differences.

The carapace is little enlarged, being little longer than three fourth the greatest width and it is constantly so-

mewhat less enlarged than the cephalothorax of *Pot. borneense* and of the variety *hilaris*. The upper surface is a little less convex in the antero-posterior direction than in *Pot. borneense* var. *hilaris* and the posterior half viz. the cardiac and intestinal regions together with the continuous parts of the undivided branchial region, appears rather flattened from side to side. The cervical groove is interrupted and the oblique anterior furrows have the same direction as in *Pot. borneense* var. *hilaris*, for they would make a right angle with one another, when prolonged backwards. The postfrontal ridge is a little developed as in *Pot. borneense*; the slightly advanced epigastric lobes, that are foveate anteriorly, smooth above and not limited off posteriorly from the gastric region, are well-defined, but on each side of them one observes, as in the two preceding species, only the rugose and coarsely punctate slope by which the gastric region subsides towards the post-orbital furrow. The mesogastric furrow is short and narrow, the anterior end of the mesogastric region is therefore not defined. The upper surface is finely punctate, rather closely on the branchial, cardiac and intestinal regions, but on the gastric region the puncta are less numerous; they are visible to the naked eye, the carapace, however, appears smooth and shining. The shallow depressions that bound the cardiac region are often indistinct.

The front resembles that of *Pot. borneense* var. *hilaris*. The free border measures one fourth the width of the carapace and is straight, not bayed at all; the lateral margins of the front have the same oblique direction and form obtuse angles with the anterior margin. Prof. Hilgendorf informs me that in the type of *Pot. borneense* these angles are more rounded off, so that the anterior frontal margin appears narrower, von Martens indeed says that it measures one third the width of the cephalothorax. As in the other form the mesogastric furrow is not continued on the front. The front is flattened, not

concave, the free border being not curved upward; the surface is somewhat granular.

The upper margin of the orbits has the same form and direction as in *Pot. borneense* var. *hilaris* and is not sinuous, as is the case with *Pot. Büttikoferi*; it forms a right or somewhat obtuse angle with the outer margin of the extraorbital tooth. The orbits and the eye-peduncles resemble those of the variety *hilaris*, the lower margin shows no notch near the outer angle, the inner angle is obtuse and little prominent. The external angles are obtuse and reach almost as far forward as the frontal margin; they are comparatively a little less distant from the epibranchial teeth than in *Pot. borneense* and its variety *hilaris*, so that the extraorbital tooth appears shorter. In the species described by von Martens the outer margin of the extraorbital tooth, from the outer angle of the orbits till the base of the epibranchial tooth, appears distinctly longer than the orbits are broad, but in *Pot. silvicola* just as long. The outer margin of the extraorbital tooth appears in most specimens slightly convex, but in others it has the same form as in *Pot. borneense* var. *hilaris* and the notch that separates it from the epibranchial tooth is just as deep. The epibranchial teeth are acute and salient, the lateral margin curves slightly outwards, so that it appears a little more convex than is usually the case in *Pot. borneense* and its variety. The oblique wrinkles are in both species numerous and moderately salient. The front-orbital and the lateral margins of the carapace are smooth, entire.

As regards the nasal plate, the epistome, the outer maxillipedes and the pterygostomian regions, there is no difference between both species. As in *Pot. borneense* var. *hilaris*, the median tooth of the epistome is triangular, acute, there is also a granular line dividing the subhepatic from the subbranchial region and these regions as also the branchiostegite carry the same rugosities. The ischial

line of the external maxillipedes is just as deep and has the same situation and direction.

The sternum shows another difference. In *Pot. borneense* and its variety *hilaris* the distance between the anterior extremity of the ischial line and the external margin of the ischium of the outer foot-jaws is always a little broader than the interspace between the anterior extremity of the abdominal cavity and the oblique posterior margins of the buccal frame; in *Pot. silvicola*, however, these two distances are equally broad. The two transverse furrows on the sternum in front of the anterior extremity of the abdominal cavity are shallow.

The abdomen has the same form as in the species that was described by von Martens.

The chelipedes of the male are very unequal, in all the left is the larger; they agree almost entirely with those of *Pot. borneense* var. *hilaris*. The upper margin of the meri bears near the distal end an acute tooth, which in the variety *hilaris* appears more spiniform. The hands resemble also those of this variety and present the same characters; the pointed fingers show, under a strong lens, the same minute granulation and rows of puncta, the toothing of the index is slightly different. The convex outer surface of the palm is smooth and shining, appears finely punctate under a strong lens, but the microscopic granulation is hardly perceptible. In the female the anterior legs are equal.

The ambulatory legs resemble those of *Pot. borneense* var. *hilaris*. The meropodites are granular on their outer surface except those of the last pair that are only punctate and their upper margin terminates into an acute tooth, the following joints are also similar in both species.

The cephalothorax of the males shows above a dark olive-green colour, marked with innumerable small spots; the margins are often ochraceous. The chelipedes are yellowish red, as also the lower surface, and like the ambulatory legs more or less distinctly spotted.

however, by the epibranchial tooth that is rudimentary, presenting itself only as a small obtuse prominence and furthermore by the different form of the abdomen. The terminal segment with obtuse tip and very slightly concave lateral margins is a little shorter than its base is broad; the penultimate segment is trapezoidal, about as long as the terminal. The anterior margin is very little broader, the posterior, however, almost once and a half as broad as this segment is long, so that the straight lateral margins diverge somewhat backwards.

The meropodites of the ambulatory legs are a little broader and there is no acute tooth at the distal end of their anterior margin. The free border of the front is slightly arcuate, in *Pot. silvicola*, however, straight. The chelipedes are still equal and feeble, the fingers in contact throughout their length and slightly longer than the palm are distinctly grooved longitudinally, but this is also still the case in the young male from Poetoes Sibau.

I cannot therefore decide whether this specimen belongs to another species or only ought to be regarded as a variety of *Iot. silvicola*.

Measurements in mm.:	♂
Breadth of the cephalothorax	13 $\frac{1}{2}$
Length " " "	12
Distance between the outer angles of the orbits	10 $\frac{3}{4}$
Distance between the epibranchial teeth	12 $\frac{1}{2}$
Distance between the outer angle of the orbit and the epibranchial tooth.	1 $\frac{3}{5}$
Distance between the free border of the front and the posterior boundary of the gastric region	7 $\frac{3}{4}$
Breadth of the free border of the front	4 $\frac{1}{2}$
Breadth of the posterior margin of the cephalothorax	7 $\frac{3}{4}$
Breadth of the orbits	2 $\frac{3}{4}$
Height " " "	1 $\frac{3}{4}$
Length of the terminal segment of the abdomen	2 $\frac{1}{4}$
" " " penultimate "	2 $\frac{1}{5}$
Breadth of the anterior margin of this segment	2 $\frac{1}{2}$
" " " posterior " " " "	3 $\frac{1}{3}$
Horizontal length of the chelae	7 $\frac{3}{4}$
" " " " fingers	4 $\frac{1}{5}$
Height of the palm	2 $\frac{3}{4}$

Subgenus *Potamon* s. s.*Potamon* (*Potamon*) *mahakkamense*, n. sp.

(Plate 8, Fig. 8).

One adult female, without eggs, was captured by Dr. Nieuwenhuis at Bloec-oe, a locality situated on the Upper Mahakkam, in the source-region of this river, not far from the source-region of the Upper Kapoeas.

This species bears such a striking resemblance to *Pot. sinuatifrons* H. M. E., three type-specimens of which from the Paris Natural History Museum are lying before me, that I at first hesitated to regard it as different. The three type-specimens, all males and collected by M. Leguillou during the Voyage of la Zélée, are of different size, the largest, however, is still considerably smaller than the female from the Interior of Borneo. *Potamon mahakkamense* now differs from *Pot. sinuatifrons* 1° by the extraorbital tooth being slightly longer with regard to the distance between the external orbital angles and having a more oblique direction, 2° by the characteristic granulation with which the whole upper surface of the carapace is covered. Though the specimens of *Pot. sinuatifrons* are varnished, this granulation seems, indeed, to want completely. For the rest, as regards the general shape of cephalothorax and legs, this species almost fully agrees with *Pot. sinuatifrons*.

The carapace is rather much enlarged, the proportion of its breadth to the length (the abdomen excluded) being as 4:3, just as in *Pot. sinuatifrons*: it is much broader at the anterior branchial regions than posteriorly and so presents a cordiform aspect. The upper surface is flattened posteriorly, moderately convex anteriorly and declivous towards the orbits and the front. The interregional grooves are very faint. The semicircular groove is shallow, in *Pot. sinuatifrons* it is deeper and the oblique lateral portions of the cervical groove are also very shallow. They

reach the postfrontal ridge at the end of the lateral cristiform portions, about 5 millimeters internally to the epi-branchial teeth. The mesogastric furrow is narrow, does not pass on to the front and bifurcates posteriorly into two faintly defined, parallel grooves, that are situated close together and reach only to the middle of the gastric region, so that, just as in *Pot. sinuatifrons*, the mesogastric area is not defined anteriorly. This area is rather small and in proportion to the width of the cephalothorax a little less broad than in *Pot. sinuatifrons*: in the latter species it measures about one fourth, in *Pot. mahakkamense* only one fifth the width of the carapace. The rugose urogastric areolets, that are not contiguous, are well-defined, but the depressions bounding the cardiac region are very shallow and indistinct. The anterior branchial region, twice as large as the posterior, is almost not separated from the latter; a shallow groove bounds the posterior branchial region posteriorly, just in front of a raised line, that runs close to and parallel with the lateral parts of the posterior margin and that ends above the legs of the fifth pair. The distance between the external orbital angles measures little more than half the breadth of the carapace. The free border of the front (Fig. 8^b), that, like the upper margins of the orbits, is obscurely crenulated, measures scarcely one fourth the width of the carapace; it shows in the middle a broad shallow bay, which is about half as broad as the frontal margin, but which, in *Pot. sinuatifrons* (Fig. 9^a) is a little less broad; the lateral sinuses are almost indistinct. The outer angles of the front are moderately sharp, the lateral margins are a little oblique, slightly divergent; they make, however, right angles with the contiguous parts of the free border, because the latter are somewhat oblique. The lateral margins of the front curve regularly into the external portion of the orbital margin and these external portions run somewhat obliquely forwards.

The interrupted post-frontal ridge resembles that of *Pot.*

sinuatifrons. The internal portions, bounding the slightly declivous epigastric lobes, are placed a little in front of and quite separate from the lateral portions; the internal portions are about as broad, taken together, as the free border of the front and are not cristiform, but only rugose and wrinkled. In *Pot. sinuatifrons*, however, they are more or less cristiform. The lateral portions are cristiform, obscurely crenulate, almost straight; they extend a little beyond the outer angles of the orbits, but stop then abruptly, at a distance of about 5 millimetres internally to the epibranchial teeth, at the end of the cervical groove. Between this spot and the epibranchial tooth one observes four or five rounded granules. The postfrontal ridge is rather far distant from the free border of the front and from the orbits; the distance between the former and the internal portions measures, in the median line of the carapace, 5 millimetres, so that the front is nearly three times as broad as long. Just as in *Pot. sinuatifrons*, the trapezoidal epigastric lobes are bounded posteriorly by shallow furrows, but they are less distinct.

The obscurely denticulate outer margin of the extra-orbital tooth is nearly straight and makes almost a right angle with the contiguous portion of the upper margin of the orbits; this margin has a much more oblique direction than in *Pot. sinuatifrons* (Fig. 8 and Fig. 9). The extraorbital tooth is slightly concave above and the outer angles of the orbits are moderately sharp; they reach almost as far forwards as the free border of the front. The epibranchial tooth is also moderately sharp, but small and little prominent; these teeth are placed, just as in *Pot. sinuatifrons*, a little before the postfrontal ridge, so that a line uniting them passes along the upper margin of the orbits. The epibranchial tooth is comparatively farther distant from the outer angle of the orbits, i. e. the outer margin of the extraorbital tooth is comparatively longer than in *Pot. sinuatifrons*. The

distance between the epibranchial tooth and the outer angle of the orbits measures justly one sixth, in *Pot. sinuatifrons*, however, only one ninth of the distance between the outer angles of the orbits, and that distance between the two teeth measures in *Pot. sinuatifrons* about one third the breadth of the orbits, but in our new species it is a little more than half as long as the orbits are broad. The small epibranchial tooth passes into a regularly curved, slightly raised and obscurely granulate or denticulate crest, that ends about at the level of the posterior boundary of the gastric region, so that the cephalothorax presents its greatest width a little in front of the limit of the anterior third of the upper surface. The postero-lateral margins are straight, rounded and converge as much backwards as in *Pot. sinuatifrons*; the posterior margin of the cephalothorax finally is slightly concave and measures about one third the breadth of the cephalothorax.

The whole upper surface appears slightly granulate. The upper surface of the front is densely covered with small, little prominent granules, about $\frac{1}{2}$ mm. broad; similar, though somewhat smaller granules are seen between the orbits and the postfrontal ridge. The anterior branchial area is densely beset, just behind the epibranchial tooth, with granules similar to those of the front and these granules pass gradually backwards into short, granulated, oblique rugae that rather densely cover the lateral margin of the carapace; they are longest and most distinct near the middle of the lateral margin and become gradually smaller backwards. Near the cervical and branchio-cardiac grooves the granules and short raised lines gradually grow smaller, more flattened and scarcely prominent at all. Flattened, partly confluent and coalescent granules are observed on the epigastric and protogastric areas and these granules become likewise smaller, more flattened and less salient posteriorly and on the cardiac and intestinal regions. To the naked eye, how-

ever, the granulation is visible over the whole upper surface of the carapace.

In the type-specimens of *Pot. sinuatifrons*, on the contrary, the upper surface appears almost everywhere smooth, there are only small granules on the front and on the extra-orbital tooth, while oblique rugae cover the lateral margin of the carapace.

The orbits are transverse, almost twice as broad as high and their width measures two thirds the breadth of the frontal margin; the lower border that is obscurely crenulate and more curved than in *Pot. sinuatifrons*, presents, as in this species, just below the outer angle of the orbits, a small triangular hiatus.

The epistome almost agrees with that of *Pot. sinuatifrons*. It is smooth, like its anterior and posterior margin; the process in the middle of the latter is formed chiefly by the median palatal ridge. The lobe at the anterior extremity of the lateral margins of the buccal frame appears regularly curved and distinctly crenulate in *Pot. sinuatifrons*, but in the new species it is angular and quite smooth (vide Fig. 8^a and Fig. 9^c).

The subhepatic region is marked in the middle with a transverse row of granules that are partly confluent and so constitute a rather salient, transverse ridge, some other granules are lying around it. The floor of the branchial chamber is densely covered with finely granulated, short oblique rugae and is distinctly defined by a groove from the subhepatic region; the branchiostegite is rugose externally and a row of small granules is seen along the furrow that separates it from the subhepatic area.

The outer maxillipedes fully agree with those of *Pot. sinuatifrons*. The furrow on the rather densely punctate ischium-joint runs a little closer to the internal than to the external margin and proceeds from the posterior to the anterior margin of the joint.

The abdomen is densely punctate.

The right chelipede is somewhat larger than the left.

The meri reach but little beyond the lateral margins of the cephalothorax, the upper edge is unarmed, but transversely rugose, the two angles of the lower surface are granular and rather sharp, especially the outer. The lower surface bears a small conical tubercle distally near the inner edge and is somewhat granular around it. The outer surface is also somewhat rugose. The carpopodites are slightly rugose above and armed at the inner angle with a strong spine, that, especially in the smaller chelipede, is somewhat flattened and compressed; beneath this spine a much smaller one is seen. The horizontal length of the larger hand measures two thirds the width of the carapace, the fingers are about just as long as the palm and the latter is almost just as high at the articulation as long. The outer surface of the palm is covered with little salient, transverse rugosities; on the upper and on the lower margin flattened granules, not at all prominent, are found, but the granules as well as the rugosities are visible to the naked eye. The pointed fingers cannot be brought into complete contact, but leave a narrow interspace when closed; they resemble those of *Pot. sinuatifrons*, presenting the same longitudinal grooves and rows of puncta; they are for the rest smooth, the dactylus appears only indistinctly granular at the base. The fingers show several teeth, that are small, obtuse and unequal. The other chela agrees with the described one, but the fingers are distinctly somewhat longer than the palm.

The ambulatory legs are also similar to those of *Pot. sinuatifrons*. They are of moderate length, so e.g. are those of the antepenultimate pair one third longer than the carapace is broad. The meropodites are rather slender, so are those of that pair almost 4-times as long as broad, and the following joints are also slender, the propodites of this pair being about 3-times as long as broad. The meropodites carry transverse rugosities on their outer surface near the upper margin, that is quite unarmed at its

distal end, those of the last pair are a little punctate, smooth. The two following joints are also rugose externally; the crest on the outer surface of the carpopodites is well-marked except on the legs of the last pair and the propodites present a longitudinal groove in the middle of their outer surface. The last joints are stout, elongate, a little longer than the propodites, well armed with small spines and slightly arcuate towards their extremities.

The cephalothorax has a light violet colour, the legs are yellowish red.

Amongst the type-specimens that I received from the Zoological Museum of Göttingen is also a female, without eggs, of that species that was referred by Bürger (in: Zoolog. Jahrbücher, herausgegeben von J. Spengel, Abth. f. System. V. 8, 1894, p. 2) to *Potamon sinuatifrons*. It belongs certainly to this species for there are no other differences from the type-specimens from the Paris Natural History Museum than with regard to the dactylopodites of the ambulatory legs. According to the measurements these joints indeed appear comparatively a little longer and somewhat narrower than in the Paris types. Bürger referred his specimens with some doubt to *Pot. sinuatifrons*, for he was misled by the figure of this species in the »Nouvelles Archives du Muséum», that is inexact as shows at first sight a comparison with my figures (Plates 8 and 9, Fig. 9). *Potamon sinuatifrons* proves consequently to inhabit the Philippine Islands (Zamboanga and Rio Jibon): the habitat was hitherto remained unknown. It is represented in Central Borneo by *Pot. mahakkamense* and *Pot. consobrinum*.

Measurements in mm.:	1	2	3	4
	♀	♂	♂	♀
Breadth of the cephalothorax	61	53	36	41
Length " " "	45	39	26½	30½
Distance between the ext. orbital angles	33½	31½	22½	26½
Breadth of the frontal margin	14	12½	8¾	10
Distance between the epibranchial teeth	44	37¾	27½	31½
Distance between the external orbital angle and the epibranchial tooth	5½	3½	2¾	3

Notes from the Leyden Museum, Vol. XXI.

	1	2	3	4
Distance, in the middle line, between the frontal margin and the postfrontal ridge	5	4	3	4
Distance between the outer angle of the front and the inner portions of the postfrontal ridge.			5	3 $\frac{3}{4}$
Distance between the outer angle of the orbits and the ends of the lateral portions of the postfrontal ridge	5 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Breadth of the mesogastric area	12 $\frac{1}{2}$	12	9	10
" of the posterior margin of the carapace.	21	15	11 $\frac{1}{2}$	15
Breadth of the orbits.	9 $\frac{1}{2}$	9 $\frac{1}{2}$	7	7 $\frac{1}{2}$
Height " " " , the margins included.	5 $\frac{1}{2}$	5	4 $\frac{1}{4}$	4 $\frac{2}{3}$
Length of the larger chela.	42 $\frac{1}{2}$	39	24 $\frac{1}{2}$	29
" " " palm.	22	19 $\frac{1}{2}$	13 $\frac{1}{2}$	14 $\frac{1}{2}$
Height " " "	19 $\frac{1}{2}$	16 $\frac{1}{2}$	10	12 $\frac{1}{3}$
Length of the legs.	85	75	50	58
" " " meropodites	27 $\frac{1}{2}$	25 $\frac{1}{2}$	18	18 $\frac{1}{2}$
Breadth " " "	7 $\frac{1}{2}$	7	5 $\frac{2}{3}$	5 $\frac{2}{3}$
Length of the propodites	16	14	10	11
Breadth " " "	5 $\frac{3}{4}$	5 $\frac{1}{4}$	3 $\frac{2}{3}$	3 $\frac{5}{6}$
Length of the dactylopodites	18 $\frac{1}{2}$	15	10 $\frac{1}{2}$	13 $\frac{1}{2}$
Breadth " " "		2	1 $\frac{1}{2}$	1 $\frac{2}{3}$

of the antepenultimate pair.

N^o. 1. *Potamon mahakkamense* n. sp.; Nos 2 and 3 type-specimens of *Pot. sinuatifrons* H. M. E., habitat unknown, from the Paris Natural History Museum; N^o. 4 Female of *Pot. sinuatifrons* H. M. E. from the Philippine Islands and belonging to the Göttingen Museum.

Potamon (Potamon) consobrinum, n. sp.

(Plates 6, 9 and 10, Fig. 10).

Telphusa sinuatifrons Milne Edwards?, Miers, in: Annals and Mag. of Natural History, Ser. 5, Vol. 5, 1880, p. 305.

One male, having lost the chelipedes, collected October 1893 by Dr. Hallier on the top of Mount Damoes, Sambas, at an altitude of 1100—1300 meter.

One somewhat younger female, without eggs, captured June 1894 in the Upper Sibau river.

There can be no doubt that these specimens belong to the same species as that which was described by Miers

(l. c.) under the name of *Telph. sinuatifrons*, but they ought to be considered as a new species, though bearing a close resemblance to the former, three type-specimens of which are lying before me (confer p. 92). *Pot. consobrinum* differs 1° by the still more depressed and flattened cephalothorax, 2° by the different shape of the front, 3° by the more enlarged joints of the ambulatory legs and by the shorter dactylopodites. 1)

The two specimens, collected at localities rather far distant from one another, though certainly belonging to one and the same species, do not fully agree, so that I prefer to treat of them separately. As the female bears a closer resemblance to *Pot. sinuatifrons* than the male does, I will describe it in the first place.

With regard to the proportion of the measurements of the carapace, the female fully agrees with the types of *Pot. sinuatifrons*. The front, however, is very little deflexed, still less than in this species, and it appears a little broader in proportion to its length. The upper margin of the orbits has namely a different direction (Fig. 10^b and Fig. 10^c); its superciliary portion, forming the lateral margin of the front, makes a very obtuse angle with the adjoining middle portion of the margin and this middle portion runs very slightly backwards before curving towards the external orbital angle. In the types of *Pot. sinuatifrons*, however, the lateral margins of the front pass constantly with a regular curve into the middle portion of the margin (Fig. 9 and Fig. 9^b) and this middle portion runs transversely outwards or even slightly forwards; the lateral margins of the front are compara-

1) Milne Edwards (in: Annales Sciences Nat. 1853, T. XX, p. 211) says that *Th. sinuatifrons* „ressemble au *Th. fluviatilis* par sa forme générale". This, however, can hardly be said. When I compare specimens of the European species from the river Sarno near Naples with the types of *Pot. sinuatifrons*, the carapace of the latter appears more enlarged and more flattened, the extra-orbital tooth has a quite other shape and direction, the antero-lateral margins are more finely denticulate, the front has a different form and is but finely granular and there are still more differences.

tively longer than in the female from the Upper Sibau and in consequence of it the front of the latter appears slightly broader. When the carapace is looked at from above, the median sinus of the frontal margin appears, in *Pot. sinuatifrons*, a little deeper than the lateral ones (Plate 8, Fig. 9^a); in the female from the river Sibau, however, the free border of the front appears almost straight in the middle, but the lateral sinuses are well-defined (Plate 6, Fig. 10^e). The postfrontal ridge almost fully agrees with that of *Pot. sinuatifrons*, the median or internal portions, however, are cristiform, in the type-specimens of the other species indistinctly so. The oblique grooves between the gastric and the epibranchial region are somewhat deeper than in *Pot. sinuatifrons* and the cardiac area is bounded posteriorly by a transverse depression from the intestinal one. In both species are the epigastric lobes distinctly defined posteriorly by a transverse furrow. The raised line above the legs of the 5th pair is more prominent than in the other species. As regards the course of the lateral margin of the cephalothorax, the form of the extra-orbital tooth and of the epibranchial one, the proportion between the distance of these teeth from one another and that between the external orbital angles, the female from the Upper Sibau agrees with *Pot. sinuatifrons*. The free border of the front and the supraorbital margin are almost smooth, but in *Pot. sinuatifrons* distinctly crenulate.

Though the type-specimens are varnished, the upper surface of the cephalothorax seems, however, to present the same structure in both species. The anterior branchial region is covered with oblique rugosities that, near the posterolateral margins, gradually pass into less salient, short, raised lines. The extra-orbital tooth is granular above, the front finely granulate. The epigastric lobes and the proto-gastric regions appear very slightly rugose anteriorly, the rest of the surface is minutely punctate.

The inferior orbital margin is distinctly crenulate in *Pot. sinuatifrons*, but in the female from the Upper Sibau scar-

cely so. With regard to the rugosities on the subhepatic and subbranchial regions both species nearly resemble one another, they are, however, less prominent. The epistome presents also the same characters, but the lobe at the anterior extremity of the lateral margins of the buccal frame, that in *Pot. sinuatifrons* is crenulate, appears nearly smooth, just as in *Pot. mahakkamense*. The external maxillipedes fully agree in both species. Sternum and abdomen are smooth, finely punctate.

Though the type-specimens of *Pot. sinuatifrons* are all males, the anterior legs seem to resemble those of the female from the Upper Sibau. The left is a little larger than the right. The angles of the lower surface of the arms are distinctly granulate in *Pot. sinuatifrons*, but almost smooth in the female, the rugosities on the upper edge are also less defined. The upper surface of the wrists carries very small, partly inosculating grooves and depressions, but in the males of *Pot. sinuatifrons* one observes finely granulated raised lines; just as in this species the inner angle is armed with a short conical spine, beneath which is a very small one. The chela of the left leg is just as long as measures the distance between the outer orbital angles, the fingers, in contact throughout their length, are a little longer than the palm, that is somewhat less high at the articulation of the fingers than it is long. The outer surface of the palm is beset with transverse rugosities and inosculating foveae, but in the types of *Pot. sinuatifrons* transverse granulated lines are seen at least on the upper margin and on the upper half of the outer surface and some granules at the base of the index. The fingers are distinctly grooved and multidentate. The ambulatory legs resemble those of *Pot. sinuatifrons*, but the propodites of the 5th pair are slightly broader and the dactylopodites a little shorter and stouter.

The male from Mount Damoes differs from the female by the following. The cephalothorax is a little broader anteriorly, as is proved by the proportion between its length

and the distance between the external orbital angles or that between the epibranchial teeth. The extraorbital tooth is comparatively larger. In the female the distance between the external orbital angle and the tip of the epibranchial tooth measures just one eighth part of that between the external orbital angles; in the male from Mount Damoes, however, one sixth, but perhaps may this difference be attributed to the different size of these specimens. In the female the free border of the front measures exactly one third the length of the carapace, just as in the type-specimens of *Pot. sinuatifrons*; in the male from Mount Damoes it is, however, considerably broader and such a specimen was described by Miers (l. c.). The front, the frontal margin, the orbits and their margins fully resemble, however, those of the female; the free border of the front (Plate 6, Fig. 10^d and Plate 9, Fig. 10^b) presents three very shallow bays, the middle of which is not deeper than the lateral.

The postfrontal ridge is a little less salient, but for the rest agrees with that of the female. The grooves between the gastric region and the epibranchial are not so deep. The median process of the posterior border of the epistome has a different form in the male and in the female (Fig. 10^f and Fig. 10^g), but this is also the case in the two specimens of *Pot. sinuatifrons*, in the larger one it is triangular about as in the female from the Upper Sibau, but in the smaller specimen its form agrees very well with that observed in the male from Mount Damoes. This difference therefore cannot be a sexual one. The posterior margin of the epistome is transverse in *Pot. sinuatifrons*, but both in the male and in the female of *Pot. consobrinum* it runs on each side slightly backwards.

The lower surface of the carapace and the outer foot-jaws fully agree in both individuals.

The abdomen (Fig. 10ⁱ) resembles that of *Pot. sinuatifrons*. The terminal segment is a little shorter than its base is broad, the lateral margins are slightly convex, the tip

is obtuse. The penultimate segment is a little shorter, its posterior margin is somewhat more, the anterior a little less than once and a half as broad as this segment is long and the lateral margins are nearly straight.

The anterior legs are unfortunately lost. The joints of the ambulatory legs are slightly broader in proportion to their length than in the female from the Upper Sibau, the dactylopodites, however, even those of the 5th pair, fully agree.

Both specimens have the same colour. The upper surface of the cephalothorax and of the ambulatory legs is olive-green, the free border of the front, the orbital and the antero-lateral margins are yellow, the lower surface presents the same colour though lighter; the anterior legs of the female are reddish with a greenish hue and the extremities of the fingers are dark brown.

I suppose that the described differences will prove to be individual or sexual or a consequence of different age, when a large series of specimens from the same localities once will be examined.

Measurements of the two specimens of *Pot. consobrinum*:

	♂	♀
Breadth of the cephalothorax	45	39
Length " " "	33	29
Distance between the external orbital angles	30	24
Breadth of the frontal margin	14	9 ² / ₃
Distance between the epibranchial teeth	38	30
Distance between the ext. orbital angle and the epibranchial tooth.	5	3
Distance, in the median line, between the frontal margin and the postfrontal ridge.	3 ¹ / ₂	3
Distance between the outer angle of the front and the internal portions of the postfrontal ridge	4 ¹ / ₂	3 ¹ / ₂
Distance between the outer angle of the orbits and the post-frontal ridge	4 ¹ / ₂	3 ¹ / ₂
Breadth of the mesogastric area	12	10 ¹ / ₂
Breadth of the posterior margin of the carapace.	13 ¹ / ₂	13
Breadth of the orbits	8	7
Height " " "	4 ³ / ₄	4
Length of the terminal segment of the abdomen	7 ¹ / ₂	
" " " penultimate " " " "	6 ¹ / ₂	
Breadth of the anterior margin of this segment	9	

	♂	♀
Breadth of the posterior margin of this segment.	10 $\frac{3}{5}$	
Length of the larger chela		24
" " " palm		10
Height " " "		9
Length of the legs of the antepenultimate pair	60	58
" " " meropodites	21	19
Breadth " " "	6 $\frac{3}{5}$	5 $\frac{1}{2}$
Length of the propodites.	11	11 $\frac{1}{2}$
Breadth " " "	5	4
Length of the dactylopodites.	13 $\frac{1}{2}$	12
Length of the legs of the penultimate pair.	62	55
" " " meropodites	19 $\frac{1}{2}$	18
Breadth " " "	6 $\frac{3}{5}$	5 $\frac{1}{2}$
Length of the propodites.	11	11
Breadth of the propodites	5	4
Length of the dactylopodites.	13	11 $\frac{1}{2}$
Length of the legs of the last pair	50	43
Length of the meropodites	16	14
Breadth " " "	6 $\frac{1}{2}$	5 $\frac{1}{2}$
Length of the propodites.	9 $\frac{1}{2}$	8 $\frac{1}{2}$
Breadth " " "	6	4 $\frac{3}{4}$
Length of the dactylopodites.	9 $\frac{1}{2}$	8

Potamon (Potamon) Melanippe, n. sp.

(Plate 9, Fig. 11).

Two males and two females were collected on the Liang Koeboeng Mountains, March and April 1894.

The largest specimen is a female without eggs, the other female somewhat younger and the abdomen of which is still triangular, was found in the forest. The larger male has about the same size as the younger female, the other male is quite young. Perhaps, however, even the largest specimen has not yet attained its full size. This remarkable species has the same enormously long and slender ambulatory legs as *Pot. austenianum* W.-Mas. from Cherra Púnjī, Assam, but it appears to be a different species. As was rightly remarked by Wood-Mason (l. c. p. 204), *Pot. austenianum* differs from all its

known congeners at first sight by the extraordinarily long and slender ambulatory legs and I will therefore firstly indicate the differences between the Indian species and that from Central Borneo.

Pot. austenianum W.-Mas. was described after a single adult female, the carapace of which is 48 mm. broad; the cephalothorax of the largest specimen from Central Borneo is not yet half as broad, but, as was already remarked, our specimens are perhaps not yet fully developed. The two females show an epibranchial tooth, obtuse and small, but the males present only a trace of it; the epibranchial teeth of *Pot. austenianum*, however, are described as »extremely salient". The epibranchial teeth pass backwards as crests that in the species from Assam are prominent and dentate, in the Borneo specimens, however, only finely denticulate or granulate. The epibranchial teeth are situated comparatively more backwards, farther distant from the external orbital angles than in the Indian species so that the extra-orbital tooth appears larger and the postfrontal ridge placed more backwards. The post-frontal ridge runs as in *Pot. austenianum*; the epigastric lobes that are finely granulate and confluent with the protogastric regions, are somewhat advanced, the mesogastric furrow between them is deep, but not continued until the cervical groove. The epigastric lobes are somewhat oblique and separated by shallow furrows from the contiguous portions of the post-frontal ridge. These external portions are granular but do not reach until the epibranchial teeth. The mesogastric area is bounded in the Indian species by distinct furrows from the rest of the gastric region; these furrows are wanting completely in *Pot. Melanippe*. The external portions of the supraorbital margins are more oblique, as may be seen by comparing my figures with those of Wood-Mason, and the orbits are little broader than high, those of *Pot. austenianum* appear to be only half as high as broad (Wood-Mason, l. c. fig. 2). The

posterior margin of the cephalothorax is considerably broader: in the species described by Wood-Mason, an adult female, the breadth of the posterior margin is not yet half as large as the distance between the external orbital angles, but in *Pot. Melanippe* it measures about three fourth parts of the latter. The merus-joint of the outer foot-jaws has a different form, the external margin being convex; the ischial line is situated a little closer to the internal margin of the ischium.

These are the principal differences, I will add still the following. The front has apparently the same shape in both species. The mesogastric furrow is continued on the front, that is strongly deflexed and its rather coarsely punctate upper surface is raised on each side into a slightly convex eminence and the superciliary portions of the upper orbital margins are also longitudinally convex. As the lateral margins of the front converge rather much towards the anterior margin, the front is much wider at the base than at the free border. The latter is slightly bayed in the middle and convex on each side; it forms obtuse rounded angles with the lateral margins. One observes, parallel with the anterior margin of the front and close to it, a very finely crenulate crest or ridge; this crest appears (Figs. 11^a and 11^b) also concave in the middle, but does not reach to the lateral margins of the front, the lateral extremities being separated from them by narrow fissures. The outer orbital angles are very salient, acute, and project a little beyond the anterior border of the front (Fig. 11^a); the outer margin of the extra-orbital tooth has a S-like form, its upper surface is somewhat concave and granular.

The antero-lateral portions of the branchial region are marked with coarse granulations and the postero-lateral margins show finely granulate, oblique wrinkles. Oblique deep grooves separate the anterior branchial lobe from the protogastric region, but these furrows are not continuous to the semicircular groove, with other words the cervical groove is interrupted. The protogastric regions are also

finely granular, the granules gradually decrease in size backwards and change into impressed puncta on which microscopical hairs are inserted, so that the metabranchial, cardiac and intestinal areae appear densely punctate. The posterior margin of the carapace is slightly concave.

The finely crenulate lower margin of the orbits shows no hiatus or incision near the external orbital angle, is regularly arcuate and the inner angle is obtuse. The posterior margin of the epistome (Fig. 11^b) is smooth and the triangular, rather obtuse tooth in the middle is separated by narrow fissures from the lateral parts that run like a S.

The branchial floor is covered with oblique wrinkles, the subhepatic region is also somewhat rugose and parallel rugae are seen on the branchiostegite near the boundary of the subhepatic area. The merus-joint of the outer foot-jaws (Fig. 11^c) is quadrate, its anterior margin is straight or a little concave, the outer margin convex; the ischial line runs near the internal margin of the ischium, somewhat obliquely and does not reach the anterior margin.

The male abdomen (Fig. 11^d) bears some resemblance to that of *Pot. borneense* v. Marts. var. *hilaris*. The terminal joint is once and a half as long as broad at the base, has a rounded extremity and its margins are slightly concave posteriorly. The penultimate joint is a little shorter, quadrate, as long as broad anteriorly and its posterior margin is a little less broad than the anterior. Sternum and abdomen are densely punctate. The abdomen of the largest female resembles that of *Pot. stoliczkanum* (Wood-Mason, l. c. pl. XII, fig. 10), but the terminal joint is triangular, its length being in proportion to its breadth at the base like 4 : 7.

Like those of *Pot. austenianum*, the chelipedes are unequal, either the right or the left being the larger; they seem to agree in both species. The upper margin of the meri carries transverse or oblique wrinkles and is unarmed at the distal end; the margins of the lower surface that bears no tubercle near the articulation of the wrist, are a little tuberculate. The wrists are granularly rugose above

and armed with a short, somewhat flattened spine at the inner angle, below which there is no other. The horizontal length of the larger chela is equal to the length of the cephalothorax and this hand is slightly more than twice as long as high; the fingers are a little shorter than the palm and are, both in the male and in the female, in contact throughout their length. The palm is densely covered with fine granules, that are partly arranged in transverse rows. The fingers are very finely granular, they are marked with longitudinal rows of puncta; the dactylus is not grooved, but a longitudinal groove is observed on the outer surface of the index, that, however, is rather shallow.

The ambulatory legs resemble those of *Pot. austenianum*, so are e. g. those of the penultimate pair 3-times as long as the carapace and the meropodites of this pair are just as long as the cephalothorax. The meropodites and the propodites of the penultimate pair are 5-times as long as broad and the terminal joints are almost as long as the propodites. The meropodites are unarmed at the distal end of their upper margin, that is transversely wrinkled or somewhat granular; their outer surface is densely punctate, though smooth. The ambulatory legs are glabrous.

The cephalothorax of the three large specimens has a dark bluish-black colour above, below on the sternum and the abdomen it is yellowish; the chelipedes are dark olive green, the fingers have yellow tips and are marked in the middle with one or two narrow yellow stripes. The ambulatory legs are black with yellow tips. The young individual is reddish brown coloured.

Measurements in mm.:

	♂	♀	♀
Greatest width of the cephalothorax	19	21½	17
Length " " "	14	16	12½
Distance between the external orbital angles	11	12½	10
" " the epibranchial teeth	15	17½	13½
Breadth of the anterior margin of the front	4½	4¾	3¾
Breadth of the posterior border of the carapace	8½	10½	8

Notes from the Leyden Museum, Vol. XXI.

	♂	♀	♀
Length of the terminal joint of the abdomen	3		
" " " penultimate segment	2½		
Breadth of the anterior margin of this segment	2½		
" " " posterior " " "	2¾		
Breadth of the orbits	3½	3½	2½
Height of " "	2	2¾	2
Horizontal length of the larger hand	14	17½	12
" " " " fingers	6½	8	5½
Height of the larger hand	6	7½	5½
Length of the legs of the penultimate pair	45		
" " " meropodites of this pair	15	16	12½
Breadth " " " " " "	3	3	2½
Length of the propodites " " "	10	11	8
Breadth " " " " " "	2	2½	1¾
Length of the dactylopodites " " "	10	11	8½

Potamon (Geothelphusa) kenepai, n. sp.

(Plates 10 and 11, Fig. 12).

One single male collected, January 1894, in a forest on Mount Kenepai.

Though this specimen bears a close resemblance to *Pot. hendersonianum* n. sp., it is to be considered, I think, as a different species.

The cephalothorax is subquadrate, little broader than long, the greatest width being in proportion to the length about as 5:4 and the distance between the outer angles of the orbits being but little shorter than the length of the cephalothorax. The branchial region, moreover, is somewhat expanded laterally, so that above the legs of the autepenultimate pair the cephalothorax appears almost just as broad as at its greatest width. The carapace is moderately convex anteriorly, depressed posteriorly and the interregional furrows are rather deep. The deep cervical groove is interrupted, as in so many other species; the anterior portions directed towards the epibranchial teeth, would make a right angle with one another when prolonged backwards. Rather deep depressions sepa-

rate the cardiac region from the intestinal one and shallow depressions are observed between the somewhat convex, anterior branchial lobe and the much smaller posterior. The slightly concave posterior margin of the cephalothorax is just half as broad as the latter.

The post-frontal ridge is only represented by the prominent epigastric lobes, that are wrinkled, advanced, confluent with the protogastric regions, but subsiding abruptly towards the front; the mesogastric furrow is deep and extends almost to the middle of the gastric region, but the mesogastric area is, however, confluent backwards with the protogastric lobes. The postorbital groove is shallow. The front fully agrees with that of *Pot. hendersonianum*, but it is slightly narrower and the lateral margins are somewhat less oblique. The upper surface of the front is a little more concave in the middle and the postorbital groove is smooth.

The nearly transverse upper margin of the orbits (Fig. 12^a) is slightly sinuous and the acute external orbital angles reach not as far forward as the front. At a short distance behind the outer angle of the orbits one observes a rudimentary epibranchial tooth, represented only by a slight notch in the margin and the small prominence passes backward and inward, for a very short distance, as an obscure crest, that is just as long as the distance between the extra-orbital angle and the epibranchial tooth. A little more backward, the cephalothorax appears very slightly swollen outside of and beneath the antero-lateral margin and, posterior to the antero-lateral crest, the whole margin of the cephalothorax is marked with oblique raised lines. To the naked eye the upper surface of the cephalothorax appears smooth and shining, but, examined under an ordinary lens, a fine and close punctation is observed on the whole surface; the puncta are of different size, larger puncta being distributed amongst numerous microscopical other ones. Strangely enough the right half of the cardiac region is quite smooth, devoid of

puncta. The margins of the front and of the orbits are smooth.

The orbits and the eye-peduncles fully agree with those of *Pot. hendersonianum* and this is also the case with the lower surface of the carapace. The median process of the posterior margin of the epistome, however, is not prominent and broadly rounded.

The ischial line on the somewhat punctate, outer maxillipedes (Fig. 12^d) is a little oblique and runs somewhat closer to the internal than to the external margin of the ischium-joint; it reaches not to the anterior margin. The merus-joint is somewhat broader than long, the slightly arcuate outer margin makes a right though rounded angle with the straight anterior one.

The abdomen resembles that of *Pot. hendersonianum*, so that I refer to the figure of that species and to the measurements. The distance between the extremity of the abdominal cavity and the posterior margin of the buccal frame (Fig. 12^e) is distinctly shorter than that between the extremity of the ischial line on the outer foot-jaws and the outer margin of the ischium. Sternum and abdomen are finely punctate.

As well the anterior as the ambulatory legs resemble almost completely those of *Pot. hendersonianum*, but the fingers of the larger hand (Fig. 12^e) show a very fine granulation, when examined under a lens. For the rest I refer to my figure and to the measurements. The upper surface of the cephalothorax has a reddish-brown colour, that is somewhat lighter on the ambulatory legs; the chelae are yellowish, but the distal half of the fingers is brown.

Measurements in millim.:

Greatest breadth of the cephalothorax	13½
Length " " "	11½
Distance between the outer angles of the orbits	10½
" " " epibranchial teeth	12
" " " outer angle of the orbits and the epibranchial tooth	1
Breadth of the free border of the front.	4½
" " " posterior margin of the cephalothorax	6½

Notes from the Leyden Museum, Vol. XXI.

Width of the orbits	3
Height " " "	2
Distance, in the median line, between the frontal margin and the epigastric lobes	$1\frac{1}{2}$
Length of the terminal segment of the abdomen	$2\frac{1}{2}$
" " " penultimate segment	$2\frac{1}{2}$
Breadth of the anterior margin of this segment	2
" " " posterior " " " "	$2\frac{1}{4}$
Length of the antepenultimate segment	$1\frac{3}{5}$
Breadth of the posterior margin of this segment	$3\frac{2}{5}$
Horizontal length of the larger hand	$10\frac{1}{2}$
" " " " fingers	$5\frac{3}{4}$
Height of the palm	5
Horizontal length of the smaller chela	$7\frac{1}{2}$
" " " " fingers	$4\frac{1}{4}$
Height of the palm	$2\frac{1}{5}$
Length of the legs of the penultimate pair	25
" " " meropodites of this pair	$7\frac{4}{5}$
Breadth " " " " " " " "	$2\frac{2}{5}$
Length of the propodites of this pair	$4\frac{1}{2}$
Breadth " " " " " " " "	$1\frac{3}{5}$
Length of the dactylopodites of this pair	$5\frac{3}{5}$
Breadth " " " " " " " "	$\frac{4}{5}$

Potamon (Geothelphusa) hendersonianum, n. sp.

(Plate 11, Fig. 13).

Two males and four females, one of which is ova-bearing, were collected, October 1893, by Dr. Hallier at the top of Mount Damoes, Sambas, at an altitude of 1100—1800 meter.

One very young male, collected by Dr. Nieuwenhuis, 1893, at the foot of Mount Damoes.

This species, that I have the pleasure to dedicate to Prof. J. R. Henderson of Madras, belongs to the subgenus *Geothelphusa*, because the post-frontal ridge is only represented by the more or less distinct, epigastric lobes and it differs from allied species by the epibranchial teeth wanting completely.

The cephalothorax is little enlarged, the greatest width

being in proportion to the length as 4:3. The gastric region is somewhat convex from before backwards (Fig. 13^b) and also from side to side; the anterior branchial lobe is slightly swollen and scarcely distinct from the posterior. The cardiac and intestinal regions finally are flattened. The cervical groove is interrupted; the two anterior shallow depressions between each protogastric region and the anterior branchial grooves that reach till near the lateral margin of the cephalothorax, would, when prolonged backwards, make an angle with one another slightly larger than a right one, their direction being very oblique; the median portion of the cervical groove is also shallow. An anterior and a posterior pair of puncta, adjoining the cervical groove on the gastric region, are quite distinct. The mesogastric furrow is moderately deep, slightly continued on to the front but not backwards, so that the gastric region is not subdivided. The epigastric lobes that are little prominent and confluent backwards with the protogastric regions, are two small areolets covered with oblique wrinkles and directed somewhat obliquely, but sometimes they are scarcely defined; they are together a little less broad than the front. On each side of the epigastric lobes the anterior boundary of the protogastric regions appears more or less distinctly wrinkled. The flattened cardiac region, somewhat broader than long, is bounded posteriorly by a shallow transverse depression from the intestinal area that is likewise much broader than long and covered with very fine transverse wrinkles, but the cardiac area is confluent, on each side, with the posterior branchial one. The urogastric lobules are small, rugose and not contiguous to one another.

The front is strongly deflexed downward and raised into two very slightly convex eminences, that are defined laterally from the upper margin of the orbits by a well-marked furrow, which curves laterally towards and issues into the quite shallow post-orbital groove or depression between the orbits and the protogastric regions. The upper

surface of the front, consequently slightly concave in the middle, appears very finely wrinkled and granular, when examined under a lens and by means of the latter a still finer granulation is observed on the post-orbital groove. The free border of the front, which, just like the upper margin of the orbits, is smooth, is divided by a moderately deep and broad median sinus into two distinctly arcuate lobes, that pass with a regular curve into the lateral margins of the front i. e. into the upper margins of the orbits, so that it is somewhat difficult to measure exactly the breadth of the free border. It appears, however, to measure about one third the width of the cephalothorax. The lateral margins of the front diverge moderately backward, so that the front is much broader at its base than at its free border; measured in the middle, the height of the front i. e. the distance between the epigastric lobes and the anterior margin, appears to be one third the breadth of the latter. A distinct transverse crest runs immediately behind and contiguous to the free border of the front, though this crest extends not along the whole breadth of the margin (Fig. 13^b).

The moderately sharp outer angles of the orbits reach a little less forward than the front; the distance between them is about as large as the cephalothorax is long. The lateral margins of the cephalothorax are S-like arcuate, so that the carapace is narrowest at the level of the posterior boundary of the gastric region and the postero-lateral margins are somewhat concave (Fig. 13). One observes almost along the whole extent of the lateral margins numerous, partly interrupted, oblique raised lines; they are rather long, reaching nearly to the middle of the branchial regions. The foremost of these lines that bounds anteriorly the oblique anterior portion of the cervical groove, runs obliquely towards the lateral margin of the cephalothorax and other interrupted lines border that groove posteriorly; between the outer angles of the orbits and these foremost oblique lines the lateral margin of the cephalothorax is slightly

carinate, but for the rest the margin is rounded. An epibranchial tooth, even an epibranchial notch, that e. g. is observed in *Geothelphusa Kuhl* de M., are wanting completely. The gastric, cardiac and branchial regions are densely punctate, for the rest smooth; the puncta are somewhat larger on the protogastric lobes than posteriorly. The slightly concave posterior margin of the cephalothorax is, in the male, about once and a half as broad as the free border of the front, in the female somewhat broader.

The orbits are transverse, their width measures two thirds of the free border of the front and they are once and a half as broad as high (Fig. 13^b). The lower margin that is finely crenulate, is slightly arcuate, without a notch near the outer angle and the obtuse inner angle is not prominent. The eye-peduncles are finely granular.

The oblique raised lines of the lateral margin of the cephalothorax pass forwards on to the inflected portion of the carapace, i. e. to the branchial floor; a smooth interspace, though no furrow, separates it from the subhepatic region, which is likewise beset with several raised lines, running, however, more transversely. The groove between the subhepatic region and the branchiostegite is deep and the latter is also covered with transverse and oblique, prominent, raised rugosities. The median process of the posterior border of the epistome is prominent, obtuse.

The well-marked ischial line on the slightly punctate outer foot-jaws runs much nearer to the inner than to the outer margin and is not continued to the anterior margin of the ischium-joint; the merus-joint is a little broader than long, the curved outer margin makes an obtuse angle with the shorter, very slightly concave anterior margin (Fig. 13^c).

The sternum of the male is smooth, finely punctate. The distance between the anterior extremity of the abdominal cavity and the posterior oblique margin of the buccal frame (Fig. 13^c) is a little broader than the distance

between the anterior extremity of the ischial line on the outer foot-jaws and the external margin of the ischium.

The male abdomen (Fig. 13^d) much resembles that of *Geothelphusa Kuhl*. The terminal joint, the lateral margins of which are slightly concave posteriorly, is a little longer than its base is broad; the penultimate segment is just as long or scarcely longer than the terminal and appears almost just as broad as long. The antepenultimate segment is a little shorter than the penultimate and just half as long as its posterior margin is broad, the lateral margins of this segment are very slightly concave.

The terminal segment of the abdomen of the female is triangular, half as long as its posterior margin is broad, with obtuse extremity.

The eggs (Fig. 13^e) are few in number, but large, their diameter measuring about 1.75 millim.

In both males the left chelipede is the larger one. The meri are short, projecting but little beyond the lateral margins of the carapace, the dorsal edge without a tooth at the extremity is transversely rugose and the outer surface is covered with finely crenulate transverse rugosities, the two inferior margins are granular, the lower surface is smooth, without a tubercle near the carpal articulation. The wrist is covered with transverse rugosities and bears at the inner angle a short tooth. The larger chela of the adult male (Fig. 13^f) is, measured horizontally, as long as the cephalothorax is broad; the fingers that leave an interspace between them when closed, are slightly longer than the palm and the latter is about as high as long. The inferior margin of the hand is slightly concave below the articulation of the fingers. The somewhat convex outer surface of the palm is smooth and shining, one observes only, by means of a lens, a few finely crenulate, transverse lines near the carpal joint. The fingers are regularly tapering; both are smooth, not grooved but marked with fine puncta, arranged in longitudinal rows, scarcely visible to the naked eye. The index is straight and bears

several small teeth, that decrease in size towards the tip, and one of which, on the middle of the finger, is the largest: the teeth of the dactylus are less prominent and this finger is strongly curved; the extremities of both fingers are pointed.

The smaller chela of the adult male measures only two thirds the length of the other; the fingers that are almost in contact, are just as long as the palm and the latter is a little less high than long. The transverse finely crenulate lines near the carpal joint extend almost to the middle of the palm and the longitudinal rows of puncta are faintly grooved.

In the second male the larger hand measures only two thirds the width of the cephalothorax, the fingers that are just as long as the palm, are in contact with one another and the dactylus is not yet arcuate; they are not grooved, but marked with longitudinal rows of puncta. The fingers of the smaller chela are slightly grooved.

In the female the anterior legs are equal or subequal.

In the ova-bearing specimen the left chela is very slightly larger than the right. The fingers are in contact, feebly toothed and more or less distinctly longitudinally grooved.

The ambulatory legs are of moderate length (Fig. 13). So are e. g. those of the penultimate pair almost twice as long as the cephalothorax is broad; the meropodites that bear no tooth at the distal end, are 3-times and the propodites a little more than twice as long as broad; the terminal joints finally are a little longer than the propodites. The compressed dactylopodites are straight, only slightly arcuate at the horny tips and stout; their edges are armed each with 6 or 7 spinules. The meropodites are marked on their outer surface with transverse rugosities, except those of the last pair that are only finely punctate. Six or seven spinules are observed along the posterior margin of the propodites. These legs carry on their margins, especially of the three terminal joints, extremely short, setose hairs.

The specimen from Mount Kenepai, that I described above as a new species, *Potamon kenepai*, is closely allied, but seems to belong to a different species. The cephalothorax, indeed, is slightly longer in proportion to its breadth, less expanded laterally at the level of the anterior branchial region and less narrowed posteriorly. There exists a rudimentary epibranchial tooth. The epigastric lobes are more prominent and the front is a little less broad. The median lobe of the posterior margin of the epistome is less prominent, broadly rounded. The distance, finally, between the anterior extremity of the abdominal cavity of the male and the posterior margin of the buccal frame is distinctly shorter than the distance between the anterior extremity of the ischial line on the outer foot-jaws and the external margin of the ischium. The fingers of the larger chela appear very finely granular under a lens, in *Pot. hendersonianum*, however, this minute granulation is scarcely perceptible.

Potamon (Geothelphusa) montanum Bürger, from the island of Luzon, a male type-specimen from the Göttingen Museum is lying before me, is a different species. The cephalothorax is not enlarged posteriorly, so that the posterolateral margins are not concave, as is the case in the Borneo-species. The oblique wrinkles on the lateral margins are shorter, less distinct and the oblique, lateral portions of the cervical groove are almost completely wanting.

The extra-orbital angle is less prominent. The free border of the front has a different shape and the posterior margin of the epistome is much deeper notched on each side of the median process. The orbits are higher in proportion to their breadth, and have a different form; the male abdomen has also another form, sternum and abdomen are much more coarsely punctate. The ambulatory legs finally are more slender than those of *Pot. hendersonianum*.

Bürger is quite wrong when he describes the cephalothorax as being not punctate: the punctulations, on the contrary, are quite distinct.

Potamon (*Geothelphusa*) *Kuhli* de Man, from Java, is still more closely allied. Two adult males and two young females from Tjibodas, described in my paper on the Crustacea collected by Prof. Max Weber in the Indian Archipelago, are lying before me. In the Java-species one observes, a little behind the outer angle of the orbits, a distinct epibranchial notch and the distance between the outer angles of the orbits is a little shorter in proportion to the width of the carapace, so that the latter appears less broad anteriorly than in *Pot. hendersonianum*. The lateral margins of the front that is more profoundly emarginate, are a little more oblique and the external portions of the supra-orbital margin that runs transversely outward in *Pot. hendersonianum* are directed somewhat obliquely forward in the Java-species; in the latter the outer angle of the orbits is much less prominent. In a front view of the cephalothorax the gastric region appears transversely a little more convex in the Borneo- than in the Java-species; the front appears in that view higher in *Pot. hendersonianum* and the two halves of the free border are arcuate in the Borneo species, but almost straight in *Kuhli* (vide de Man, in: Max Weber, Zoologische Ergebnisse einer Reise nach Niederländisch Ost-Indien, T. II, 1892, Pl. XV, fig. 3a).

The interspace between the inner angle of the inferior orbital margin and the front is broader in the Java species than in the other. The merus-joint of the outer foot-jaws has a somewhat different form and in *Pot. Kuhli* the ischial line reaches to the anterior margin of the ischium. The male abdomen presents not exactly the same form. The dactylus of the larger chela of the male is more strongly arcuate in *Pot. hendersonianum*; the ambulatory legs have about the same shape in both species, but the dactylopodites are different. In *Pot. Kuhli* they are narrower, more slender and bear in this species a smaller number of spines on their posterior margin, so e. g. on the penultimate pair only three, but five in the other species.

Measurements in millim.:

	♂	♂	♂	♀	♀
Greatest width of the cephalothorax	17 $\frac{1}{2}$	12	6 $\frac{3}{4}$	14	11 $\frac{1}{2}$
Length " " "	13 $\frac{1}{2}$	9 $\frac{1}{2}$	5 $\frac{1}{2}$	11	9 $\frac{1}{4}$
Distance between the external orbital angles	12 $\frac{1}{2}$	9 $\frac{1}{2}$	5 $\frac{3}{4}$	10 $\frac{3}{4}$	9 $\frac{1}{2}$
Breadth of the free border of the front	5 $\frac{1}{2}$	4 $\frac{1}{2}$	2 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{3}{4}$
Distance, in the median line, between the free border of the front and the epigastric lobes	1 $\frac{3}{4}$	1 $\frac{1}{2}$	$\frac{5}{6}$	1 $\frac{1}{2}$	1 $\frac{1}{3}$
Breadth of the posterior margin of the carapace	8 $\frac{1}{2}$	6 $\frac{1}{2}$	3 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$
Length of the terminal segment of the abdomen	2 $\frac{3}{4}$	1 $\frac{5}{8}$	1 $\frac{1}{5}$		
" " " penultimate segment	2 $\frac{3}{4}$	2	1 $\frac{1}{4}$		
Breadth of the anterior margin of this segment	2 $\frac{2}{3}$	1 $\frac{3}{4}$	1 $\frac{1}{6}$		
" " " posterior " " " " "	2 $\frac{3}{4}$	1 $\frac{5}{6}$	1 $\frac{1}{6}$		
Length of the antepenultimate segment	2	1 $\frac{2}{5}$	$\frac{4}{5}$		
Breadth of the posterior margin of this segment	4 $\frac{1}{3}$	3 $\frac{1}{3}$	1 $\frac{3}{4}$		
Horizontal length of the larger chela	16 $\frac{1}{2}$	8	3 $\frac{1}{2}$	7 $\frac{3}{4}$	6 $\frac{1}{2}$
" " " " fingers	9	4	1 $\frac{3}{4}$	4 $\frac{1}{4}$	3 $\frac{1}{4}$
Height of the palm	8 $\frac{1}{4}$	4	1 $\frac{2}{3}$	3	2 $\frac{2}{3}$
Horizontal length of the smaller chela	11 $\frac{1}{2}$	7 $\frac{2}{3}$	3 $\frac{2}{3}$	7 $\frac{1}{4}$	6 $\frac{1}{2}$
" " " " fingers	5 $\frac{1}{4}$	3 $\frac{1}{4}$	1 $\frac{5}{6}$	4	3 $\frac{1}{2}$
Height of the palm	4 $\frac{2}{5}$	2 $\frac{1}{4}$	1 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$
Length of the legs of the penultimate pair	31	22 $\frac{1}{2}$	13	24	22
" " " meropodites	9 $\frac{1}{2}$	7 $\frac{1}{2}$	4 $\frac{1}{4}$	7 $\frac{1}{4}$	7
Breadth " "	3	2 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{2}{3}$	2 $\frac{2}{3}$
Length of the propodites	5 $\frac{3}{4}$	4 $\frac{1}{4}$	2 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{2}{5}$
Breadth " " "	2 $\frac{1}{5}$	1 $\frac{2}{3}$	1	1 $\frac{1}{4}$	1 $\frac{2}{3}$
Length of the dactylopodites	7	5 $\frac{1}{4}$	3	6	5

Potamon (Geothelphusa) Bürgeri, n. sp.

(Plates 11 and 12, Fig. 14).

One single male, captured on Mount Liang Koeboeng.

This species that I have the pleasure to name after Prof. O. Bürger of Göttingen, author of a paper on Thelphusidae, has a rather thick cephalothorax, for it is a little thicker than half the greatest width. The cephalothorax is almost quadrate, little enlarged, the greatest width, anteriorly, being only one and one fourth times as broad as the cephalothorax is long. The upper surface appears, in a lateral view, strongly convex from before backwards, very slightly also from side to side. The semicircular groove, bounding the gastric region posteriorly,

is shallow, but the oblique lateral portions of the cervical groove are wanting completely. The branchial regions that are undivided, are separated by a shallow transverse groove from the intestinal area, but the cardiac region that is very slightly convex transversely, is confluent both with the adjoining intestinal and branchial regions. The two urogastric areolets are distinct, they are not contiguous and slightly wrinkled. The mesogastric furrow dividing the two little prominent epigastric lobes, is narrow and continued neither on the front nor backwards, so that the gastric region is undivided and, as has already been observed, this region is also confluent with the branchial lobes. The two epigastric lobes are wrinkled above, slightly declivous towards the front, but confluent with the gastric region as well backwards as laterally. The gastric region as well as the branchial one slightly slope downwards towards the orbits, but, except the epibranchial lobes there is no trace of a postfrontal ridge.

The scarcely salient outer angles of the orbits, that project somewhat less forward than the front, are almost as far distant from one another as the cephalothorax is long, the distance between them being but very slightly shorter than the length of the cephalothorax. In a front-view of the cephalothorax (Fig. 14^b), the orbits show a very slight oblique direction; they are just as broad as the free border of the front and once and a half as broad as high. They have an oval outline, the finely crenulate lower margin is entire, without a notch near the outer angle and the inner angle is triangular, not at all prominent. The front is very narrow, the free border measuring exactly one third the distance between the extraorbital angles, and the front is about half as high as the free border is broad. When the carapace is looked at from above, the free border appears divided by a median triangular emargination into two arcuate lobes (Fig. 14^a), but in a front-view (Fig. 14^b) the frontal margin appears almost straight. The front is slightly

inflected inward in the middle, and the small inflected portion is bounded above by an angular crest (Fig. 14^b). The outer angles of the front are rounded, they are almost right, so that the lateral margins of the front are nearly parallel, very little convergent.

The lateral margins of the cephalothorax are S-like curved (Fig. 14). They at first diverge somewhat outward, ascending upwards, so that the cephalothorax appears broadest anteriorly, along a line dividing the anterior fourth part from the second. This foremost portion of the lateral margin is surmounted by a finely crenulate raised line or ridge and it appears slightly angular at a distance of one millimeter from the extraorbital angle, but there is no trace of an epibranchial tooth. The lateral margins then curve inward and at last again outwards, so that at their posterior extremity, above the legs of the penultimate pair, the cephalothorax presents its greatest width (Fig. 14), being here even a little broader than anteriorly. The postero-lateral margins are rounded and marked with oblique raised lines that are continued on the lower surface of the cephalothorax; these lines are altogether wanting, however, just above the bases of the ambulatory legs. A few short, oblique, finely crenulate raised lines are also seen on the anterior branchial lobe. The upper surface of the cephalothorax is smooth and shining; examined under an ordinary lens it appears finely punctate, the puncta are more crowded on the posterior branchial and intestinal regions than elsewhere. The front, that is very slightly concave in the middle, appears somewhat uneven near the lateral margins.

A faint groove separates the branchial floor from the subhepatic region on which one observes a few small rugosities, and rather prominent oblique rugae are found on the branchiostegite. The epistome is smooth, the median tooth is narrow, prominent and obtuse (Fig. 14^b). The outer foot-jaws (Fig. 14^c) are a little punctate, the puncta on the ischium-joint are somewhat larger than those on the

merus-joint. The ischial line on the outer foot-jaws runs near the internal margin and is prolonged till near the anterior border of this joint; the merus-joint is quadrate, the slightly arcuate outer margin makes an obtuse angle with the much shorter anterior one.

The abdomen (Figs. 14^d and 14^e) resembles that of *Potamon borneense*, var. *hilaris*, being quite narrow and with concave lateral margins. The distance between the anterior extremity of the abdominal cavity and the oblique posterior margins of the buccal frame is a little larger than that between the anterior extremity of the ischial line on the outer foot-jaws and its external margin (Fig. 14^e). As regards the shape of the abdomen, I refer to the figure and to the measurements. Sternum and abdomen are smooth with rare punctulations.

The right chelipede (Fig. 14^f) is much larger than the left. The arm is short, its upper margin without a tooth at the distal end and with short transverse rugosities on its outer surface; the lower surface is smooth, without a tubercle near the carpal articulation and with rather sharp margins that are beset with acute granules. The carpus is covered with small rugosities and its inner margin shows a row of small acute tubercles; there is a short, acute, slightly compressed spine at the inner angle. The larger chela is stout, almost as long as the cephalothorax is broad and the fingers, in contact throughout their length, are just as long as the palm. The palm is very slightly higher than long, a few very small granules, that are not at all prominent, are scattered on the rounded upper margin of the palm, a few also on the very convex outer surface near the carpal articulation and on the rounded lower margin, but the greater part of the outer surface is quite smooth, even not punctate. The fingers are together less high than the palm, so that the lower margin of the index is not placed in the same horizontal line as the arcuate lower margin of the palm. The outer surface of the somewhat compressed immobile finger is very slightly convex,

but flattened at the base and covered with small, acute, little prominent granules, that are more crowded on the lower margin than on the outer surface. The dactylus is also covered with similar granules, especially above, and under a lens rows of very fine puncta are moreover observed, but the fingers are not grooved. Both fingers carry some small teeth, two of which on the index are somewhat larger than the others. The inner surface of the hand is almost smooth.

The smaller chela measures only two thirds the width of the cephalothorax, the palm is a little less high than long, and the fingers that are slightly longer than the palm, are distinctly grooved longitudinally, each groove presenting a row of puncta. The fingers are more slender than those of the other hand and more feebly toothed.

The ambulatory legs are long and slender, so are e. g. those of the penultimate pair three times as long as the cephalothorax. The meropodites of this pair, just as long as the latter, are three times as long as broad; the propodites of this pair, half as long as the cephalothorax, are $2\frac{1}{2}$ -times as long as broad in the middle and the dactylopodites are a little longer than the propodites.

The dactylopodites are slender, straight and quite narrow, tapering but very slightly towards the extremities, so are e. g. those of the penultimate pair about 9-times as long as broad at the base; they are armed with several small spinules along their edges. The posterior margin of the propodites, that are covered with small depressed granules arranged partly in a longitudinal row, carries also 6 or 7 spinules, the anterior margin of the meropodites is quite unarmed, without a tooth at the distal end and their outer surface is covered with a few small rugosities, except those of the last pair that are smooth. For the rest the ambulatory legs are glabrous.

Pot. angustifrons A. M. E., from Cape York, a type-specimen of which from the Paris Natural History Museum

is lying before me, is a different species. In this form, indeed, there is an epibranchial tooth; the front is much broader than the orbits and appears more enlarged, with the lateral margins more oblique. The postorbital groove is much deeper and the cephalothorax is much narrower posteriorly than anteriorly, that is not the case in *Potamon Bürgeri*. The dactylopodites of the ambulatory legs have about the same form in both species, but they are longitudinally ridged above in the Australian species, smooth in *Pot. Bürgeri* and the propodites of these legs are somewhat more slender in the latter.

The Borneo-collection contains also a female without eggs, unfortunately the locality has not been indicated. This specimen very probably belongs to the same species though it shows a few slight differences (Plate 12, Fig. 149). In the male, described above, the upper orbital margin runs very slightly backwards, in the female however slightly forwards. The epigastric lobes are ill-defined. The ambulatory legs are a little more slender, as will be seen by comparing the measurements. The chelipedes seem to present only the usual sexual differences. The right chela is somewhat larger than the left; it is less high than that of the male, the granulation extends almost over the whole surface of the palm and the index is very slightly grooved. The smaller chela agrees with that of the male, but the granulation is more distinct. The female has a somewhat larger size than the male.

Measurements of both specimens:

Length of the cephalothorax	♂ $10\frac{1}{4}$	♀ $11\frac{1}{2}$
Distance between the external orbital angles	$9\frac{2}{3}$	$10\frac{1}{4}$
Greatest width of the cephalothorax anteriorly.	$13\frac{1}{2}$	$15\frac{1}{2}$
" " " " " posteriorly.	$13\frac{1}{2}$	$15\frac{3}{4}$
Breadth of the posterior margin of the cephalothorax	$7\frac{3}{4}$	9
Breadth of the free border of the front.	$3\frac{1}{2}$	3
Height of the front i. e. the distance, in the median line, between the epigastric lobes and the frontal margin.	$1\frac{3}{4}$	2
Thickness of the cephalothorax	$7\frac{1}{2}$	$8\frac{1}{2}$
Breadth of the orbits	$3\frac{1}{5}$	$3\frac{1}{3}$
Height " " "	2	2

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Length of the terminal segment of the abdomen	$2\frac{1}{2}$	
" " " penultimate "	$2\frac{1}{3}$	
Breadth of the anterior margin of this segment	$1\frac{1}{3}$	
" " " posterior " " " "	$2\frac{1}{5}$	
Length of the antepenultimate segment	$1\frac{1}{2}$	
Breadth of the posterior margin of this segment	$3\frac{1}{2}$	
Horizontal length of the larger chela	12	12
" " " " fingers	$5\frac{1}{4}$	$5\frac{3}{4}$
Height of the hand	$6\frac{3}{4}$	$5\frac{1}{4}$
Horizontal length of the smaller hand	9	$9\frac{1}{4}$
" " " " fingers	$4\frac{1}{5}$	$5\frac{1}{4}$
Height of the smaller hand	$3\frac{3}{4}$	$3\frac{3}{4}$
Length of the legs of the penultimate pair	30	34
" " " meropodites of this pair	10	$10\frac{2}{3}$
Breadth " " " " " "	$3\frac{1}{4}$	$3\frac{1}{5}$
Length " " propodites " " "	$5\frac{1}{2}$	$6\frac{3}{4}$
Breadth " " " " " "	2	2
Length of the dactylopodites " "	7	$8\frac{1}{2}$

Potamon (Geothelphusa) bicristatum, n. sp.

(Plate 12, Fig. 15).

Two females, without eggs, were collected by Dr. Büttikofer on Mount Liang-Koeboeng. Both specimens are almost of the same size, the larger one was captured in a forest.

This species presents some affinities to *Pot. (Geothelphusa) Dehaani* White and *Pot. (Geothelphusa) obtusipes* Stimps., both from Japan; specimens of the former are lying before me.

The cephalothorax is rather much enlarged, the proportion between the width and the length being like 7 : 5; it presents its greatest breadth along a line dividing the anterior third of the upper surface from the middle. The upper surface appears slightly convex anteriorly, as well from before backwards as transversely, curving regularly downwards towards the front, but it is flattened posteriorly. The interregional grooves are as little developed as in *Pot. Dehaani*. The cervical groove is distinctly

marked mesially as the usual semicircular groove, but there is no trace at all of the lateral portions, the gastric region being confluent with the branchial one. The cardiac region is likewise not defined, the branchio-cardiac grooves are quite indistinct. The small urogastric areolets that are not contiguous, are only defined by minute puncta, but by no grooves and the depression between the anterior and the posterior branchial region is very faint. The narrow linear mesogastric furrow is continued on the front and also backwards, almost to the middle of the gastric region but does not bifurcate. The epigastric lobes are faintly marked: they are separated anteriorly by a transverse groove from the front and each lobe is bounded posteriorly by a slightly oblique ridge, in front of which one observes a row of fine puncta. These two ridges (Fig. 15^a) meet together at the mesogastric furrow and they are a little farther distant from the anterior groove than the latter from the free border of the front. In the smaller specimen the two ridges are indistinct, the transverse rows of minute puncta being only developed. On each side of the epigastric lobes one observes a transverse ridge, that runs somewhat obliquely forward and outward; these two ridges that are characteristic of our species and that are equally distinct in both individuals, so that the specific name is derived from them, are apparently the rudimentary traces of the post-frontal ridge. They reach laterally as far as the eye-peduncles and are nearly straight.

The distance between the outer orbital angles that are not at all prominent, measures about two thirds the greatest width of the cephalothorax, the proportion between both being as 5 : 3. The free border of the front (Figs. 15^a and 15^b) that is straight, not emarginate in the middle, measures one fourth the greatest breadth of the cephalothorax. It makes angles of 135° with the upper margins of the orbits, about as in *Pot. Dehaani*, so that the shape of the front is nearly the same in both species, the front being distinctly broader above than at the free border.

The front is almost vertically deflexed downward, appears very slightly concave in the middle and its height, in the middle, measures one third the breadth of the free border. The front projects a little more forward than the outer angles of the orbits.

The lateral margins of the cephalothorax are regularly arcuate. The antero-lateral margin is raised into an obscurely denticulate crest that curves a little inward there where the cephalothorax is broadest. There is even no trace of an epibranchial tooth. The postero-lateral margins that are straight, converge slightly backwards, so that at their posterior extremity, above the base of the legs, the cephalothorax is still almost once and a half as broad as measures the distance between the external orbital angles; the postero-lateral margins are rounded and marked with 8 or 9 short oblique, raised lines. The posterior margin of the cephalothorax that is somewhat concave in the middle, is just twice as broad as the free border of the front and but little less broad than the distance between the external orbital angles.

The upper surface of the cephalothorax is smooth and shining; examined under a lens one observes everywhere a fine punctation, the puncta are more numerous on the cardiac and posterior branchial regions than anteriorly and are rare on the mesogastric area. Near the antero-lateral margins a few oblique wrinkles are more or less distinct, but a granulation is nowhere observed; on the front and just behind the orbits a few larger puncta are distributed. The free border of the front and the upper margin of the orbits are quite smooth. In a front view of the cephalothorax (Fig. 15^b), the oval orbits appear somewhat oblique; they measure two thirds the breadth of the frontal margin and are about half as high as broad. The regularly arcuate and obscurely crenulate lower margin presents no hiatus near the outer angle and the inner angle is not dentiform, not at all prominent. The eye-peduncles are smooth, punctate.

The median process of the smooth posterior margin of the epistome is broadly triangular and terminates into the prominent, compressed, median, palatal ridge, visible in a front-view of the cephalothorax; the lateral ridges are also distinct. A faint transverse groove separates the subhepatic region from the branchial floor, both these regions as also the branchiostegite are nearly smooth, the oblique wrinkles on the postero-lateral margins of the cephalothorax reaching not far on the floor of the branchial chamber. The merus-joint of the outer foot-jaws is a little broader than long (Fig. 15^c); the arcuate outer margin makes an obtuse angle with the shorter straight anterior one. The ischial line runs, a little obliquely, just in the middle of the ischium-joint, but does not reach the anterior margin. The outer foot-jaws are punctate, smooth.

The abdomen of the female is also finely punctate, the terminal segment is triangular with obtuse extremity. The chelipedes of the female are small, the right is somewhat larger than the left. The arms are short, the upper margin unarmed at the distal end, the lower surface smooth, with no tubercle near the carpus and with entire margins; the upper margin carries a few oblique wrinkles. The upper surface of the wrist is slightly wrinkled outwards and near the inner margin, but almost smooth in the middle; there is a small acute spine at the inner angle. The right chela is a little more than half as long as the carapace is broad, the fingers, in contact with one another, are slightly longer than the palm that is just as high as long. The palm bears on its outer surface a few small, more or less sharp tubercles, that are somewhat larger at the base of the immobile finger and that are also observed on the two ridges bounding the longitudinal groove on the outer surface of this finger; the faintly grooved dactylus is also a little tubercular. The immobile finger is armed with eight or nine acute teeth, about of the same form and size, those of the dactylus are

smaller. The other chela is smaller, but for the rest agrees with the right.

The ambulatory legs are slender and moderately long, so are e. g. those of the penultimate pair a little more than twice as long as the cephalothorax. The meropodites of the penultimate pair are 4-times as long as broad, their upper margin is slightly rugose. but devoid of a tooth at the distal end and their outer surface is nearly smooth. The propodites of this pair are about 3-times as long as broad, they show a few small spines along their posterior margin, but they are also smooth. The terminal joints of the penultimate legs are 6-times as long as broad at the base, slightly longer than the propodites and taper rather regularly towards the slightly arcuate tips; some small spinules are observed along their margins. The three terminal joints of the ambulatory legs are also smooth and glabrous.

The cephalothorax is lead-coloured, the legs are lighter and yellowish marmorate.

Potamon Dehaani may at first sight be distinguished by its less enlarged cephalothorax, that is considerably longer in proportion to its breadth. The antero-lateral margin is more coarsely granulate and one of these granules is sometimes more prominent than the others and then appears as a rudimentary epibranchial tooth, but in other specimens there is no trace of such a granule. The lateral ridges, traces of the postfrontal crest, that are observed in *Pot. bicristatum*, are quite absent in the Japanese species. The oblique rugosities on the postero-lateral margins are indistinct or quite wanting in *Pot. Dehaani*. The posterior margin of the cephalothorax is much broader in the Borneo-species than in the other and so still other differences might be enumerated.

Potamon obtusipes Stimps. from the Japanese island of Ousima is also different, I think. According to measurements of this species published some time ago (de Man, in: Max Weber, Zool. Ergebnisse einer Reise nach Nieder-

ländisch Ost-Indien, T. II, 1892, p. 290) the cephalothorax of this species appears also somewhat longer in proportion to its breadth than that of *Pot. bicristatum*, the upper surface is somewhat granular near the anterolateral margin and probably not ornamented with the ridge-like traces of the post-frontal crest that are characteristic of the species of Mount Liang-Koeboeng: no doubt still many other differences exist.

Measurements in millim.:

	♂	♀
Length of the cephalothorax	12 $\frac{1}{2}$	12 $\frac{1}{4}$
Greatest width of the cephalothorax	17 $\frac{1}{2}$	17
Distance between the external orbital angles	10 $\frac{3}{4}$	10 $\frac{2}{3}$
Breadth of the free border of the front.	4 $\frac{2}{3}$	4 $\frac{3}{4}$
Height of the front i. e. the distance between the frontal margin and the epigastric lobes	1 $\frac{1}{2}$	1 $\frac{1}{2}$
Breadth of the posterior margin of the carapace	9 $\frac{1}{4}$	9 $\frac{1}{2}$
Breadth of the orbits	3	3
Height " " "	1 $\frac{3}{4}$	1 $\frac{3}{4}$
Horizontal length of the larger chela.	9 $\frac{3}{4}$	
" " " fingers	5 $\frac{1}{2}$	
Height of the palm	4 $\frac{1}{4}$	
Length of the legs of the penultimate pair	30	30
Length of the meropodites of this pair	9 $\frac{3}{4}$	9 $\frac{3}{4}$
Breadth " " " " " "	2 $\frac{2}{5}$	2 $\frac{2}{5}$
Length " " propodites " " "	6	6
Breadth " " " " " "	1 $\frac{4}{5}$	1 $\frac{4}{5}$
Length " " dactylopodites " " "	7 $\frac{1}{4}$	7

Metopograpsus M. E.

Metopograpsus messor Forsk., var. *gracilipes* de M.

Metopograpsus messor Forskål, de Man in: Max Weber, Zool. Ergebnisse einer Reise nach Niederl. Ost-Indien, T. II, 1892, p. 314.

Metopograpsus messor Forskål, var. *gracilipes* de Man in: Zoolog. Jahrb., herausgegeben von J. Spengel, T. IX, Abth. für System. p. 75.

One female was collected by Dr. Hallier in 1893 at the isle of Lemoekoetan near Singkawang; it has no eggs and unfortunately has lost the anterior legs.

I was enabled to compare it with the ova-bearing female from Padang, mentioned in the first of the two papers quoted above. Both specimens closely agree with one another and certainly belong to the variety *gracilipes*, established by myself in 1891 (Notes from the Leyden Museum, Vol. XIII, p. 49) after a young male from the Pacific Ocean, but the carapace of the female from the isle of Lemoekoetan is somewhat shorter in proportion to the distance between the outer orbital angles. In Dr. Hallier's specimen the front is a little less prominent and its anterior margin is straight in the middle, but in the other a median emargination, though quite shallow, is still perceptible. The ambulatory legs fully agree. The named differences may, I think, be regarded as individual.

Measurements in mm.:	1	2
	♂	♀
Distance between the external orbital angles	17 $\frac{2}{3}$	16 $\frac{2}{3}$
Length of the cephalothorax	11 $\frac{1}{4}$	12 $\frac{1}{4}$
Breadth of the front	11	10 $\frac{1}{2}$
Length of the propodites in the middle	5 $\frac{1}{2}$	5 $\frac{2}{3}$
Breadth " " " " " "	2	2 $\frac{1}{6}$
Length " " daetylopodites	4 $\frac{1}{2}$	4 $\frac{1}{2}$

N^o. 1. Female collected by Dr. Hallier, N^o. 2 that from Padang.

Sesarma Say.

Sesarma (*Sesarma*) *Amphinome*, n. sp.

(Plate 12, Fig. 16).

Five specimens, viz. 2 males and 3 females, were collected by Max Moret, probably at Sintang.

Miss Rathbun has recently proposed (in: Proc. Biol. Soc. of Washington, Vol. XI, 1897, pp. 89 and 90) the name of *Sesarma* for my subgenus *Episesarma* and that of *Holometopus* M. E. for my subgenus *Sesarma* and I think she is in the right.

This new species now belongs to the subgenus *Sesarma*

Rathb. and bears some resemblance to *Sesarma angustifrons* A. M. E. The male from Tahiti that was referred by myself, in 1889, to the latter species (in: Zool. Jahrbücher, Abth. für System. T. IV, p. 432, Pl. X, fig. 10), was, upon my demand, kindly sent me by the Direction of the Senckenbergische Gesellschaft at Frankfort on the Main, so that I now am able to indicate the differences.

The 5 specimens of *Ses. Amphinome* are, I think, still young, none of the females carrying eggs and therefore it is a pity that no more specimens were collected.

As regards the general shape of the cephalothorax, the new species closely resembles *Ses. angustifrons*, the slightly concave lateral margins diverging also somewhat backwards, so that the cephalothorax is broadest above the legs of the antepenultimate pair. The cephalothorax is, however, a little shorter in proportion to the distance between the external orbital angles and the straight posterior margin is comparatively broader than in *Ses. angustifrons*.

In the male from Tahiti the posterior margin is just half as broad as the distance between the outer angles of the orbits and less broad than the front, but in *Ses. Amphinome* it is considerably broader and distinctly broader than the front. The upper surface is slightly convex from before backwards. The interregional grooves are somewhat deeper and more distinct than in the *Sesarma* from Tahiti; in the male of *Ses. angustifrons* the mesogastric region is undivided, but in *Ses. Amphinome* it is distinctly tripartite. The protogastric regions are covered with some small tubercles anteriorly, immediately behind the post-frontal lobes and the hepatic area is also somewhat tubercular; in the male from Tahiti these small tubercles are not observed. The upper surface of the cephalothorax appears finely punctate under a magnifying glass, but the puncta are irregularly distributed. On the tubercular anterior half of the protogastric regions, on the hepatic area, on the grooves between the three parts of the

mesogastric lobe and on the intestinal and posterior branchial regions the puncta are very fine, numerous and crowded; on the rest of the surface the puncta are rare and the transverse anterior branchial lobes, that are situated immediately behind the protogastric regions, are almost smooth, devoid of puncta. The strongly declivous lateral sides of the cephalothorax are covered with numerous oblique raised lines.

The upper margin of the front is a little more than half as broad as the distance between the extra-orbital angles, the proportion of its breadth to the latter is the same as in *Ses. angustifrons*. The four post-frontal lobes, placed in a straight transverse line, are separated from one another by rather deep grooves just as in *Ses. angustifrons*; they are prominent, though they do not conceal the inferior margin of the front, when the carapace is looked at from above. The internal lobes (Fig. 16^a) are once and a half, in *Ses. angustifrons* (Fig. 17) almost twice as broad as the external; they are rounded and almost smooth. The front (Figs. 16^a and 16^b) that is a little concave and vertically deflexed downwards, making a right angle with the upper surface of the cephalothorax, is almost 4-times as broad as high in the middle; it has a somewhat different form in both species. The lateral margins, indeed, that are parallel with one another in *Ses. angustifrons*, slightly converge in *Ses. Amphinome* and the inferior margin is a little arcuate. The latter presents a slight, moderately broad emargination in the middle, in *Ses. angustifrons* (Fig. 17) the median sinus is much deeper; in a front-view of the cephalothorax this median emargination is also visible, in the other species not. On each side of the median sinus one observes on the front a transverse ridge, about as broad as the inner post-frontal lobes and contiguous to the lower margin of the front; these ridges that do not reach the lateral angles of that margin, are quite absent in *Ses. angustifrons*.

In the middle the front appears somewhat granular. In

one of the female specimens the lateral grooves dividing the postfrontal lobes from one another are wanting, the internal lobes being coalescent with the external ones, but this is of course an abnormality. The orbits are large as in *Ses. angustifrons* and the eye-peduncles project a little more beyond them than in the species from Tahiti.

Both species may at first sight be distinguished by the different shape of the extraorbital tooth. In *Ses. Amphinome* (Fig. 16^a) this tooth is less prominent, less acute and comparatively much smaller than in *Ses. angustifrons*, its outer margin is more curved inward and the notch separating it from the epibranchial tooth is larger and deeper. In the species from Tahiti only a trace of a second epibranchial tooth is observed, but in *Ses. Amphinome* this second tooth is quite distinct though small and little prominent, and separated from the first by a distinct notch; both epibranchial teeth project laterally less outwards than the extra-orbital tooth and are obtuse. In *Ses. angustifrons* the extra-orbital tooth is slightly longer than the epibranchial, but in *Ses. Amphinome* the first epibranchial tooth appears distinctly somewhat larger and longer than the extra-orbital; the outer margin of the first epibranchial tooth is slightly arcuate and this tooth is somewhat raised upwards. A few short fine hairs are seen on the postfrontal lobes, on the tubercles of the hepatic area and on the lateral margins of the epibranchial teeth.

As regards the lower surface of the cephalothorax, e. g. the form of the epistome and of the outer maxillipedes, the two species closely resemble one another; in both the merus-joint of the latter is little longer than broad, the proportion being as 6 : 5, it is oval and rounded anteriorly.

The abdomen of the male (Fig. 16^c) has also about the same form, but the penultimate segment is a little shorter in proportion to its breadth: in the male of *Ses. angustifrons* the penultimate segment is $2\frac{1}{2}$ mm. long, its posterior margin $5\frac{1}{5}$ mm. broad.

The chelipedes of the male are almost equal; they nearly agree with those of *Ses. angustifrons*. In both species the inner angle of the wrist is obtuse, without a trace of a tooth and the upper surface is granular. In the larger male the horizontal length of the hand (Fig. 16^d) measures two thirds the width of the cephalothorax. The fingers are regularly tapering and have pointed tips, while those of *Ses. angustifrons* are slightly excavated at the extremities, but this may perhaps depend upon their young age. The fingers are a little longer than the palm. The convex outer surface of the latter is granular as also its upper margin, that presents no trace of pectinated ridges; the convex inner surface bears a transverse row of granules, between which and the wrist the surface is somewhat granular, in *Ses. angustifrons*, however, one observes a prominent transverse crest with granulated edge. The dactylus is somewhat granular at base, for the rest quite smooth and the immobile finger is also smooth; a few very short fine hairs are distributed on palm and fingers. The ambulatory legs almost closely resemble those of *Ses. angustifrons*, as is also proved by the measurements. The meropodites e. g. of the penultimate pair are 3-times, the propodites almost 4-times as long as broad and the terminal joints are just as long as the propodites. The meropodites are armed with an acute tooth at the end of their upper margin and show transverse rugosities on their outer surface, while those of the last pair are almost smooth. The dactylopodites (Fig. 16^e) are slender, slightly curved towards the pointed extremities; along the posterior margin of these joints and of the propodites two rows of movable spines are observed. Along the anterior and the posterior margin of the three terminal joints, short stiff hairs are distributed, black at their proximal and white at their distal half, but for the rest all these joints are smooth, not tomentose; a few similar hairs are also seen on the margins of the meropodites. One observes these hairs likewise on the ambulatory legs of *Ses. angustifrons*, but the

three terminal joints are moreover more or less tomentose along their margins and the dactylopodites and propodites are unarmed, devoid of spines (Fig. 17^b).

Measurements in mm.:

	♂	♂	♀	♀	♀
Distance between the external orbital angles . . .	10	8½	10½	10	9½
Greatest width of the cephalothorax.	11	9¼	11½	11½	10½
Length " " "	9	7¾	9¾	9	8¾
Breadth of the upper margin of the front.	5½	4½	5¾	5¼	5
Height of the front in the middle	1½	1½	1½	1½	1¼
Breadth of the posterior margin of the cephalothorax.	6	5½	7	6½	6½
Length of the terminal segment of the abdomen.	1¾	1½			
" " " penultimate segment	1¾	1½			
Breadth of the anterior margin of this segment.	2	1¾			
" " " posterior " " " "	3¾	3½			
Horizontal length of the chela.	7	4½	6	5¾	5½
" " " " fingers	3¾	2¾	3½	3¼	3½
Height of the hand	3½	1½	1½	1½	1½
Length of the meropodites	8	8	8½	7¾	7½
Breadth " " "	2¾	2¾	3	3	2¾
Length of the propodites	5½	5½	5½	5½	5
Breadth " " "	1½	1½	1½	1½	1½
Length of the dactylopodites	5½	5½	5	5	4¾
Breadth " " "	¾	¾	¾	¾	½

Ierseke, May 1899.

List of all the species of *Potamon* Sav. (inclusive *Parathelphusa* H. M. E.) described up to the present time, May 1899¹⁾.

1) This List was published already last year in: *Annali del Museo Civico di Storia Nat. di Genova*, Ser. 2, Vol. XIX, 1898, p. 435, of course without the Borneo-species described in this paper.

The *african* species are printed in italics. The three following, a description of which has never appeared as far as I know, are nomina nuda and are not mentioned in the List. These species are *Pot. gracilipes* White 1847 from the Philippine Islands and furthermore *Pot. granulosum* Marts. and *Pot. Schweinfurthi* Marts., two species quoted by Hilgendorf (*Monatsberichte k. Akad. d. Wiss. Berlin*, 1878, p. 802).

As habitat I have only quoted the locality indicated in the first description of the species.

Notes from the Leyden Museum, Vol. XXI.

Subgenus *Potamon* s. s. and subg. *Geothelphusa* Stps.

1. *Abbotti* Rathbun 1898 Malay Peninsula.
2. *africanum* A. M. E. 1869 Gaboon.
3. *Anchietae* Cap. 1870 North of Angola.
4. *andersonianum* W.-Mas. 1874 W. Yunnan, Upper-Burma.
5. *angustifrons* A. M. E. 1868 Cape York.
6. *artifrons* Bürg. 1894 Philippine Islands.
7. *atkinsonianum* W.-Mas. 1871 Darjeeling, Nepal.
8. *Aubryi* H. M. E. 1853 Gaboon.
9. *aurantium* Hbst. 1799 East-Indies.
10. *austenianum* W.-Mas. 1871 Cherra Pünji.
11. *Ballayi* A. M. E. 1886 Congo.
12. *bayonianum* Cap. 1864 North of Angola.
- » *var. z.* Cap. 1870 South of Angola.
13. *Berardi* Aud. 1826 Egypt.
14. *bicristatum* de M. 1899 West-Borneo.
15. *bipartitum* Hilgd. 1898 German East-Africa.
16. *Bottegoi* de M. 1898 Country of the Somali.
17. *Bürgeri* de M. 1899 West-Borneo.
18. *callianira* de M. 1888 Mergui Archipelago.
19. *cariniferum* de M. 1888 Mergui Archipelago.
20. *celebense* de M. 1892 Celebes.
- » *var. lokaensis* de M. 1892 Celebes.
- » *var. pareparensis* de M. 1892 Celebes.
21. *chilense* Hell. 1862 Chili.
22. *consobrinum* de M. 1899 West-Borneo.
23. *corrugatum* Hell. 1868 Madras, Java.
24. *crassum* A. M. E. 1869 Cape York.
25. *crassum* Miers 1884 (Report Voyage of H. M. S. »Alert”, 1884, p. 235). Thursday Island.
26. *cristatum* A. M. E. 1869 Habitat unknown.
27. *Cumingii* (White) Miers (Report Voyage of H. M. S. »Alert”, 1884, p. 236) Philippine Islands.
- *28. *cunicularis* Westw. 1836 Western Gháts.
29. *Decazei* A. M. E. 1886 Franceville, San-Benito.
30. *Dehaanii* White 1847 Japan.
31. *denticulatum* H. M. E. 1853 China.
32. *depressum* Krauss 1843 Natal.

*) The species marked with an asterisk, are those the description of which I have *not* been able to consult. There are among the species mentioned in the List several synonyms some of which have been indicated.

- depressum* var. *Johnstoni* Miers 1885. Kilima-njaro.
33. *difforme* H. M. E. 1853 = *Berardi* Aud. »Red Sea”.
34. *dubium* Cap. 1873 Rio Cunene, Mossamedes.
» var. *Jullae* Nob. 1896 Kazungula.
35. *Edwardsi* W.-Mas. 1871. Yunan, Upper-Burma.
36. *emarginatum* Kingsl. 1880. West-Africa; Port-Natal.
37. *Emini* Hilgd. 1892 Victoria Nyansa.
38. *enodis* Kingsl. 1880 Ceylon.
39. *fluviatile* Latr. 1803 Southern Europe.
40. *Goudoti* H. M. E. 1853 Madagascar.
41. *granosum* Koelbel 1884 = *socotrense*
Hilgd. Isle of Socotora.
42. *granulatum* de M. 1892. Java.
43. *grapsoides* White 1847 Philippine Islands.
44. *Guerini* H. M. E. 1853 Habitat unknown.
45. *hendersonianum* de M. 1899 West-Borneo.
46. *Hilgendorfi* Pfeff. 1889 German East-Africa.
47. *hippocastanum* Müll. 1887 Trincomali.
48. *hispidum* W.-Mas. 1871. Upper-Burma.
49. *hydrodromus* Hbst. 1796 Tranquebar.
- *50. *ibericum* (Bieberstein) 1809 Caucasus.
51. *indicum* Latr. 1825 India.
52. *inflatum* H. M. E. 1853 Port-Natal.
53. *infravallatum* Hilgd. 1898. German East-Africa.
- *54. *intermedium* Czern. 1884
- (According to Ortmann (1897) this species is identical with *Pot. ibericum* (Bieb.)).
55. *Jagori* Marts. 1868 Isle of Luzon.
56. *japonicum* de H. = *Dehaani* White. Japan.
(Confer: Herklots, *Symbolae Carcinologicae*, 1861, p. 13).
57. *kenepai* de M. 1899 West-Borneo.
58. *Kuhli* de M. 1883. Java.
59. *laeve* W.-Mas. 1871 Cherra Púnjí, Goalparah.
60. *Larnaudii* A. M. E. 1869 Bangkok.
» var. *brevimarginata* de M. 1892. Sumatra.
61. *Leichardti* Miers 1884 (Report Voyage
of H. M. S. »Alert”, 1884, p. 236). West-Australia.
62. *Leschenaulti* H. M. E. 1837 Pondichery.
63. *levicervix* Rathbun 1898 Loo Choo Islands.
64. *limula* Hilgd. 1882 Isle of Salanga.
65. *longipes* A. M. E. 1869. Poulo Condore.
66. *loxophthalmum* de M. 1892 Borneo.
67. *lugubre* W.-Mas. 1871 India.
68. *macropus* Rathbun 1898 Liberia.

69. *madagascariense* A. M. E. 1872 . . . Madagascar.
 70. *mahakkamense* de M. 1899 . . . Upp. Mahakkam, Borneo.
 71. *margaritarium* A. M. E. 1869 . . . St. Thomé.
 72. *masonianum* Hend. 1893 . . . India.
 73. *Melanippe* de M. 1899 . . . West-Borneo.
 74. *montanum* Bürg. 1894 . . . Isle of Luzon.
 75. *mrogorocnse* Hilgd. 1898 . . . German East-Africa.
 76. *Neumannii* Hilgd. 1898 . . . German East-Africa.
 77. *obesum* A. M. E. 1868 . . . Zanzibar.
 78. *obtusipes* Stps. 1858 . . . Japan.
 79. *pealianum* W.-Mas. 1871 . . . Assam.
 80. *Pelii* Herkl. 1861 . . . St. George-del-Mina.
 81. *perlatum* H. M. E. 1837 . . . Cape of Good Hope.
 82. *philippinum* Marts. 1868 . . . Philippine Islands.
 83. *pictum* Marts. 1868 . . . Isle of Luzon.
 84. *pilosum* Hilgd. 1898 . . . German East-Africa.
 85. *planatum* A. M. E. 1869 . . . Bombay.
 86. *planifrons* Bürg. 1894 . . . Cape York.
 87. *platycntron* Hilgd. 1897 . . . East-Africa.
 88. *pocockianum* Hend. 1893 . . . India.
 89. *Reichardi* Hilgd. 1898 . . . East-Africa.
 90. *rotundum* Q. & G. 1824 . . .
 91. *rugosum* Kingsl. 1880 . . . Ceylon.
 92. *senex* Fabr. 1798 . . . East-Indies.
 93. *siamense* A. M. E. 1869 . . . Siam.
 94. *sinuatifrons* H. M. E. 1853 . . . Philippine Islands.
 95. *socotrense* Hilgd. 1883 . . . Isle of Socotora.
 96. *soror* Zhnt. 1894 . . . Ceylon.
 97. *subquadratum* Gerst. 1856. Manilla.
 98. *sumatrense* Miers 1880 . . . Sumatra.
 99. *suprasulcatum* Hilgd. 1898 . . . German East-Africa.
 » *var. pseudoperlata* Hilgd. 1898. » »
 100. *stoliczkanum* W.-Mas. 1871 . . . Penang.
 101. *tenasserimense* de M. 1898 . . . Tenasserim.
 102. *transversum* Marts. 1868 . . . Cape York.
 103. *tumidum* W.-Mas. 1871 . . . Yunan, Upper-Burma.
 *104. *Wüllerstorfi* Hell. 1862.
 105. *sp.* Miers 1880 (On a Collection of
 Crustacea from the Malaysian
 Region) Habitat unknown.
 106. *sp.* de M. 1880 (de Man, Expédition
 de Sumatra) Moeara-Laboe, Sumatra.
 107. *n. sp.?* de M. 1898 Burma.
 108. *sp.* de M. 1898 Tenasserim.

Subgenus *Perithelphusa* de M.

1. borneense Marts. 1868 Borneo.
- " " var. hilaris de M. 1899. West-Borneo.
2. Büttikoferi de M. 1899. West-Borneo.
3. silvicola de M. 1899. West-Borneo.
4. sp. de M. 1899 West-Borneo.

Subgenus *Parathelphusa* H. M. E.

1. *Brazzae* A. M. E. 1886 Congo.
2. brevicarinata Hilgd. 1882. Isle of Salanga.
3. *Campi* Rathbun 1894. Stanley Pool, Congo.
4. *Chaperi* A. M. E. 1887 Assinie.
5. *Chavancsi* A. M. E. 1886 Franceville.
6. convexa de H. (inedit.) Java.
7. crenulifera W.-Mas. 1876. Pegu Yomah, Burma.
8. dayana W.-Mas. 1871 Burma.
9. Edwardsi W.-Mas. 1876 India.
10. Feae de M. 1898 Burma.
11. maculata de M. 1879 Sumatra.
12. Martensi W.-Mas. 1876 India.
13. *nilotica* H. M. E. 1837 Nile.
14. *Pocilei* A. M. E. 1886 Alima Lateké, Congo.
15. salangensis Ortm. 1893 = brevicarinata Hilgd. 1882 Isle of Salanga.
16. sinensis H. M. E. 1853 China.
17. spinigera (White) W.-Mas. 1871 Calcutta.
18. tridens Fabr. 1798 East-Indies.
19. tridentata H. M. E. 1853 Indian Archipelago.

EXPLANATION OF THE PLATES.

Plate 5.

Fig. 2. *Menippe Ortmanni* n. sp., female, $\times 2$; 2a dorsal view of the anterior part of the carapace, $\times 4$; 2b antennal region and orbit of the left side from before, $\times 4$; 2c outer maxillipede, $\times 4$; 2d larger ehela, $\times 2$.

Fig. 3. *Potamon (Parathelphusa) tridentatum* H. M. E., the three terminal segments of the largest male from Mount Kenepai, $\times 2$.

Fig. 4. *Potamon (Perithelphusa) borneense* v. Mart. var. *hilaris* n., adult male, $\times \frac{1}{2}$; 4a cephalic region of this specimen from before,

$\times \frac{3}{2}$; *4b* abdomen and anterior extremity of the sternum of this specimen, $\times \frac{3}{2}$; *4c* outer maxillipede, $\times \frac{3}{2}$; *4d* right or larger chela of the same male, $\times \frac{3}{2}$.

Plate 6.

Fig. 5. *Potamon (Perithelphusa) Büttikoferi* n. sp., adult male, $\times \frac{3}{2}$; *5a* dorsal view of the anterior part of the carapace of this specimen, $\times 2$; *5b* cephalic region of the same male from before, $\times 2$; *5c* outer foot-jaw, $\times 2$; *5d* distal half of the abdomen and anterior part of the sternum of the male, $\times 2$; *5e* larger chela of adult male, $\times 2$.

Fig. 10*d*. *Potamon (Potamon) consobrinum* n. sp., front of the male from Mount Damoes from above, $\times 2$; 10*e* the same of the female, $\times 2$.

Plate 7.

Fig. 1. *Myomenippe Leguilloui* A. M. E., cephalothorax of an adult male, type-specimen from the Paris Natural History Museum, collected by Leguillou in the "Mer des Indes", $\times \frac{3}{2}$.

Fig. 6. *Potamon (Perithelphusa) silvicola* n. sp., adult male, $\times \frac{3}{2}$; *6a* external maxillipede and anterior part of the sternum of the male $\times 2$; *6b* larger chela of adult male, $\times 2$.

Fig. 7. *Potamon* sp., dorsal view of the anterior part of the cephalothorax of the male, $\times 3$; *7a* abdomen, $\times 3$.

Plate 8.

Fig. 8. *Potamon (Potamon) mahakkamense* n. sp., dorsal view of the anterior part of the carapace of adult female, $\times \frac{3}{2}$; *8a* cephalic region of this specimen from before, $\times \frac{3}{2}$; *8b* front from above, $\times 2$; *8c* external maxillipede, $\times \frac{3}{2}$; *8d* larger chela of the same specimen, $\times \frac{3}{2}$.

Fig. 9. *Potamon (Potamon) sinuatifrons* H. M. E., dorsal view of the anterior portion of the carapace of the largest male, 53 mm. broad, type-specimen from the Paris Natural History Museum, $\times 2$; *9a* front of this specimen from above, $\times 2$.

Plate 9.

Fig. *9b*. *Potamon (Potamon) sinuatifrons* H. M. E., dorsal view of the anterior portion of the cephalothorax of a male, 36 mm. broad, type-specimen from the Paris Natural History Museum, $\times 2$; *9c* posterior margin of the epistome of this specimen, $\times 4$.

Fig. 10*b*. *Potamon (Potamon) consobrinum* n. sp., dorsal view of the anterior part of the carapace of the male from Mount Damoes, $\times 2$; 10*c* the same of the female from the Upper Sibau river, $\times 2$; 10*f* posterior margin of the epistome of the male, 10*g* of the female, $\times 2$.

Fig. 11. *Potamon (Geothelphusa) Melanippe* n. sp., female, $\times 2$; 11*a* dorsal view of the anterior portion of the carapace of this specimen,

× 3; 11*b* cephalic region of the same female from before, × 3; 11*c* external maxillipede of female, × 3; 11*d* abdomen of male, × 3; 11*e* larger chela of male, × 3.

Plate 10.

Fig. 10. *Potamon (Potamon) consobrinum* n. sp., male from Mount Damoes, × 1½; 10*a* cephalic region of this specimen, × 2; 10*h* outer foot-jaw of male, × 2; 10*i* abdomen of male, × 2; 10*j* left chelipede of female, × 2.

Fig. 12. *Potamon (Geothelphusa) kenepai* n. sp., male, × 2; 12*a* dorsal view of the anterior part of carapace, × 4; 12*c* anterior extremity of the sternum, × 4; 12*d* outer foot-jaw, × 4.

Plate 11.

Fig. 12*b*. *Potamon (Geothelphusa) kenepai* n. sp., cephalothorax from before, × 4; 12*e* larger chela, × 4.

Fig. 13. *Potamon (Geothelphusa) hendersonianum* n. sp., adult male, × 2; 13*a* dorsal view of the anterior part of the cephalothorax of the same male, × 4; 13*b* cephalic region of the same specimen from before, × 4; 13*c* outer foot-jaw, × 4; 13*d* abdomen of male, × 4; 13*e* anterior part of the sternum of male, × 4; 13*f* larger chela of adult male, × 2; 13*g* egg, × 2.

Fig. 14. *Potamon (Geothelphusa) Bürgeri* n. sp., male, × 2; 14*a* dorsal view of the anterior portion of carapace, × 4; 14*b* cephalic region from before, × 4; 14*c* outer foot-jaw, and anterior extremity of the sternum, × 4; 14*d* abdomen of male, × 2; 14*e* penultimate segment of abdomen of male, × 4; 14*f* larger chela, × 2.

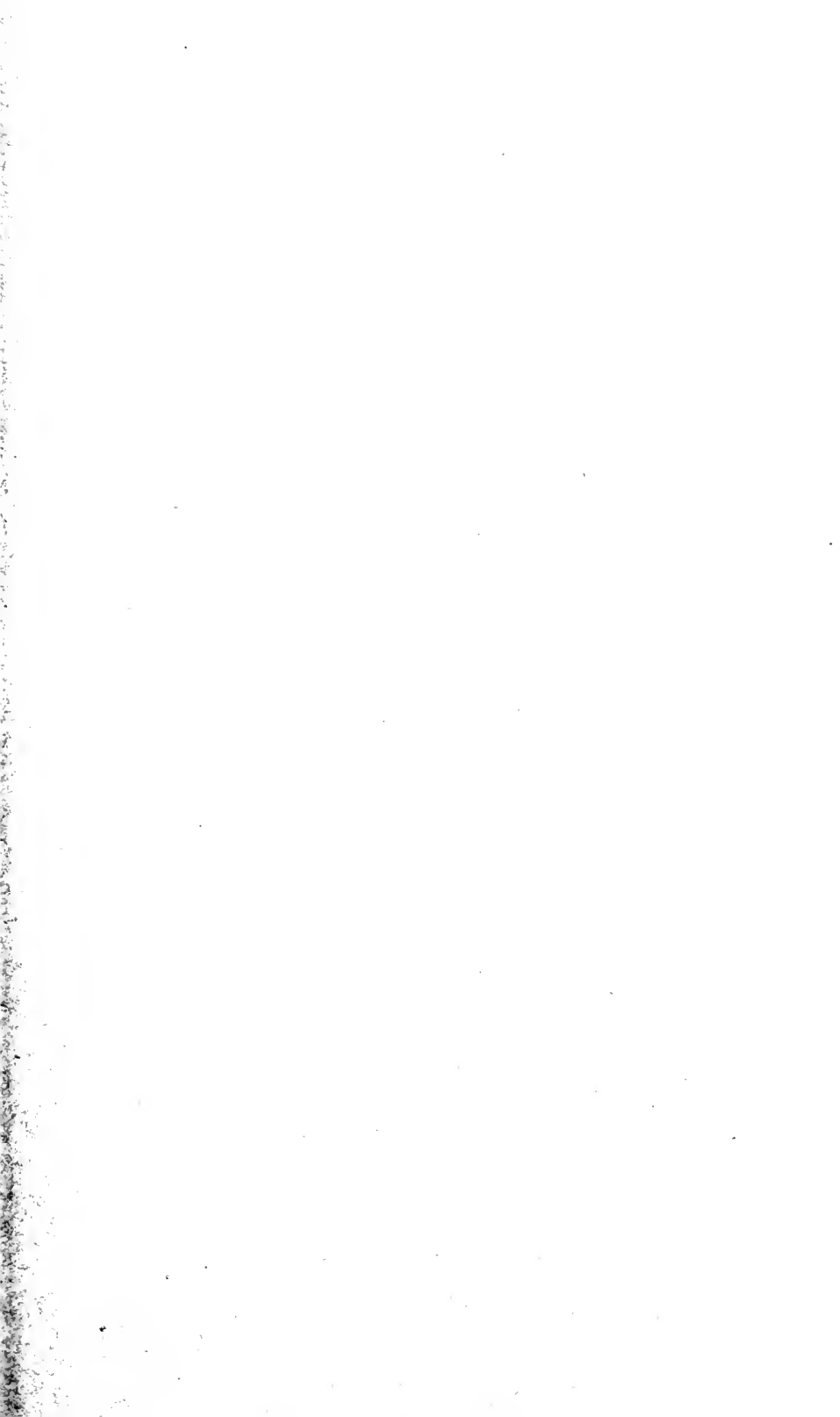
Plate 12.

Fig. 14*g*. *Potamon (Geothelphusa) Bürgeri* n. sp., dorsal view of the anterior portion of the carapace of the female without definite locality, × 4.

Fig. 15. *Potamon (Geothelphusa) bicristatum* n. sp., female, × 2; 15*a* dorsal view of the anterior portion of the carapace, × 4; 15*b* cephalothorax from before, × 4; 15*c* external maxillipede, × 4; 15*d* larger hand of female, × 4.

Fig. 16. *Sesarma (Sesarma) Amphinome* n. sp., male, × 2; 16*a* dorsal view of the anterior portion of the cephalothorax of male, × 4; 16*b* cephalic region of male, × 4; 16*c* abdomen of male, × 4; 16*d* chela of male, × 4; 16*e* two last joints of penultimate pair of legs, × 4.

Fig. 17. *Sesarma (Sesarma) angustifrons* A. M. E., male from the Fiji Islands, dorsal view of the anterior portion of cephalothorax, × 4; 17*a* cephalic region from before, × 4; 17*b* two terminal joints of penultimate pair of legs, × 2.



List of Works published by E. J. BRILL, Leyden.

- Archiv (Niederländisches)** für Zoologie, herausgegeben von Prof. EMIL SELENKA u. fortgesetzt von Prof. C. K. HOFFMANN. 1871—82. Band I—V. 8°. f 58.—
 ——— Supplementband I. 1881—1882. m. 1 Karte und 23 Taf. f 20.—
 (Enthaltend die zoologischen Ergebnisse der in den Jahren 1878 und 79 mit Schoener "Willem Barents" unternommenen arktischen Fahrten).
- Blaauw (F. E.)**, A Monograph of the Cranes. Large folio. 1897. With coloured plates, put on stone by KEULEMANS from original watercolour sketches drawn from life by LEUTEMANN and KEULEMANS f 75.—
- Bouwstoffen** voor eene fauna van Nederland, onder medewerking van onderscheidene geleerden en beoefenaars der dierkunde, bijeenverz. door J. A. HERKLOTS. 3 dln. 1851—66. 8°. f 18.70
- Max Weber**, Zoologische Ergebnisse einer Reise in Niederländisch Ost-Indien. Band I—III. Band IV, Heft 1. f 84.—
- Museum d'histoire naturelle des Pays-Bas.** Revue méthodique et critique des collections déposées dans cet établissement, par H. SCHLEGEL. vol. I—VIII. 8°. f 33.25
 ——— **F. A. Jentink**, Table alphabétique. 1881. f 4.—
 ——— ——— Vol. IX: Catalogue ostéologique des Mammifères. f 9.50
 ——— ——— Vol. X, 2^e partie: Catalogue ostéologique des Poissons, Reptiles et Amphibies par TH. W. VAN LIDTH DE JEUDE 1898. 8°. f 1.75
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 ——— ——— Vol. XIV: Catalogue systématique de la collection d'oiseaux de feu Mr. J. P. VAN WICKEVOORT CROMMELIN, par F. A. JENTINK. 1894. 8°. f 1.50
- Notes** from the Leyden Museum, ed. by H. SCHLEGEL a. F. A. JENTINK. Vol. I—VIII. 1879—86. 8°. per vol. f 5.—
 ——— ——— Vol. IX—XX. 1887—98. 8°. per vol. f 7.50
- Piaget (Dr. E.)**, Les Pédiculines. Essai monographique, 2 vol. 1880. vol. I: texte, vol. II: planches. gr. in-4°. *En toile*. f 60.—
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- Schlegel (H.)**, Monographie des Singes. 1876. 8°. f 4.75
 ——— ——— Oiseaux des Indes Néerl., décrits et fig. (f 34,80) gr. in-4°. f 25.—
- Snellen (P. C. T.)**, De vlinders van Nederland, Microlepidoptera, systematisch beschreven. 2 dln. 1882. gr. 8°. Met 14 pl. . f 15.—

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NOTES

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BY

Dr. F. A. JENTINK,

Director of the Museum.

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NOTE VII.

**ZOOLOGICAL RESULTS OF THE DUTCH SCIENTIFIC
EXPEDITION TO CENTRAL BORNEO.**

THE BIRDS

BY

Dr. J. BÜTTIKOFER.

(Plates 13—15).

When writing my introduction to Dr. Jentink's treatise on the Mammals collected during my sojourn in Borneo (N. L. M. XIX (1897), pp. 1—26), I had no idea that the publication of the present paper, which at that time was nearly ready for the press, would have to undergo such a long delay. But the duties of my new position as Director of the Zoological Garden at Rotterdam absorbed so much of my time that I could not think much about finishing my manuscript. And even now I am, for want of time, unable to do what I originally had proposed myself to do, i. e. to give a critical review of the birds of Borneo, but must content myself with an enumeration of the species obtained by myself and my companions, especially by my assistant Mr. Max Moret, who, after my return to Europe, made a small collection of birds in the surroundings of Pontianak near the west coast, and of Dr. A. W. Nieuwenhuis ¹⁾, who, from May 1896 to May 1897 and

1) See my above-mentioned introduction, p. 25, and a paper from the hand of Dr. Jentink's on the Mammals collected on this second expedition by Dr. Nieuwenhuis (N. L. M. XX (1898), p. 113).

from November 1898 to March 1899, made collections of birds on the Upper Kapoeas ¹⁾ and on the River Mahakkam (East-Borneo) and its tributaries.

Moreover I am indebted to Mr. L. Westenenk, an officer in the Dutch colonial civil service, at that time »Assistant Resident» at Sanggau, for a small collection of birds preserved in spirits, from the junction of the Sekajam with the Kapoeas River and sent to me after my return to Leyden.

In my above-mentioned introduction ²⁾ I have plainly sketched the oro- and hydrographical conditions of the country as well as its climate and vegetation, factors which are of great influence upon the ornithology of the explored territory, so that I hardly need to add any more particulars to it.

At the same place I called attention to the lack of water-birds in my collection, due to my neglecting to spend some time in the coast-region, and the small collection made by Mr. Moret at Pontianak has not added an important number of species of water-birds.

The bird-collections made by Dr. Nieuwenhuis, also enumerated in the present paper ³⁾, contain among the 815

1) The letters «oe» in Dutch geographical names ought to be pronounced as «uh».

2) Since the publication of this introduction, in which I enumerated (p. 1) the publications on various parts of the zoological collections of our expedition, the following papers on this subject have been published in the Notes from the Leyden Museum:

M. M. Schepman, description of a new *Unio* from Borneo. Vol. XX, p. 92 (pl. 1).

Dr. O. Finsch, on the specific distinction of the Ground-Cuckoos of Borneo and Sumatra. Vol. XX, pp. 93—96.

Dr. F. A. Jentink, the Mammals, collected by Dr. Nieuwenhuis on his second expedition to Borneo. Vol. XX, pp. 113—125 (pl. 2).

Dr. J. G. de Man, Crustaceans of the Dutch Borneo-Expedition, part I. *Macroura*. Vol. XX, pp. 137—161 (plates 6, 7 and 8); — id., part II. *Brachyura*. Vol. XXI, pp. 53—144 (plates 5—12).

Dr. R. Horst, on the variability of characters in Perichaetidae. Vol. XX, p. 206.

3) These important collections, as well as mine, have kindly been presented to the Leyden Museum by the «Maatschappij ter bevordering van het natuurkundig onderzoek der Nederlandsche Koloniën.»

specimens, representing 165 species, only 26 species which were not stated by myself from the western side of the watershed, and none were obtained which most likely would not occur in the Kapoeas-basin as well.

With such a great number of species, this collection is quite sufficient to state that east from the watershed the ornis does not show any essential difference from that of the Kapoeas-region. It may now, as I already suggested in my introduction to the enumeration of the mammals, be considered as a matter of fact that the homogeneity of the ornis of Borneo is extremely great throughout the vast island, especially as far as the lowland up to an altitude of 1000 meter is concerned.

The region of the Upper Kapoeas having previously been entirely unexplored, I expected to obtain a number of new species, especially in the mountain-forests, but although I worked very hard in collecting as many interesting species as possible, paying special attention to the smaller and more unobvious forms, there is not a single really new form among the 269 species collected, and only two species (*Harpactes orrhophaeus* and *Cyanoderma poliogaster*), already known from other islands or from the Continent, were obtained which had not been recorded before from Borneo.

These facts are pleading very strongly for the perseverance and the great success with which the Kina Balu and the mountainous interior of Sarawak have been explored by energetic naturalists as Whitehead, Everett and Hose, who added so many new species, especially mountain forms, that we were not able to enrich this great number with a single new species.

The specimens treated of in the present paper, have been collected in the following localities and on the following dates ¹⁾.

1) As to the geographical position of these localities see the map in the above-mentioned introduction.

A. COLLECTION BÜTTIKOFER.

Poctoes Sibau Nos 1—11 (November 29th—December 1st 1893).

Smitau Nos 12—131 (December 6th—17th 1893).

Rocma Manoeal (foot of Mount Kenepai) Nos 132—354 (December 21st 1893—January 12th 1894).

Mount Kenepai (Station 550 meter above the level of the sea) Nos 355—616 (January 14th—February 1st 1894).

Siniai River (near Nanga Raoen, Mandai Valley) Nos 617—629 (March 7th—12th 1894).

Mount Liang Koeboeng (780—1135 meter above the level of the sea) Nos 630—1176 (March 13th—May 3rd 1894).

Nanga Raoen (a Dyak village in the Mandai Valley) Nos 1177—1325 (May 8th—22nd 1894).

Poelau (on the Sibau River, a northern tributary of the Upper Kapoeas) Nos 1326—1500 (May 31st—July 9th 1894).

B. COLLECTION MORET.

Pontianak (near the west-coast) Nos 1501—1574 (Dec. 7th 1894—Febr. 18th 1895).

C. COLLECTION WESTENENK.

Sanggau (at the junction of the Sekajam with the Kapoeas River) Nos 1601—1702, all in spirits (second half of 1894).

D. COLLECTION SCHÄDLER.

A collection of 26 specimens (Nos 1701—1726) made by Mr. Schädler, a friend of Mr. Moret, at Pontianak during the winter 1895—96, also enumerated in the present paper.

E. COLLECTION NIEUWENHUIS.

(This collection was made with the aid of his assistant F. Freiherr von Berchtold).

Poctoes Sibau Nos 1—25 (May 16th—June 9th 1896).

Long Bloë River (a southern tributary of the Upper Mahakkam) Nos 26—81 (September 10th—October 26th 1896); Nos 94—98 (November 12th—23rd 1896); Nos 121—127 (December 10th—20th 1896); Nos 138—145 (January 26th—May 10th 1897).

Bruny River (a southern tributary of the Long Bloë River) Nos 99—116 (November 27th—December 16th 1896); Nos 128—137 (January 16th—25th 1897).

Lower Mahakkam River Nos 146—174 (May 10th—25th 1897).

This collection was accompanied by a journal from the hand of Mr. von Berchtold, with a number of interesting field-notes which are made use of in the present paper, with the exception of the vernacular names. These latter, as a rule, have not the value ascribed to by several authors, as they very often are untrustworthy and misleading. It happens not seldom that one and the same name is bestowed upon several species (manau tana = ground-bird on all the species of *Pitta* and some other terrestrial birds) or that quite different names, even in the same places and by the same people, are in use for one and the same species.

A very large and important bird-collection has been made by Dr. Nieuwenhuis on his second voyage on the Upper Mahakkam from November 20th 1898 to March 1st 1899. This collection arrived in the Leyden Museum a week ago and was enregistered in the present paper after this latter was made ready for the press. The collection contains 658 specimens representing 141 species, ten of which had not been represented in our previous collections.

Dr. Nieuwenhuis having meanwhile undertaken a new expedition in East-Borneo, this time more to the north, we may hope that he will be able to continue his collecting work in a territory which is zoologically still quite unknown, and that his new collections will strongly increase our knowledge of the ornithology of the island, though

we may not expect many forms not stated already from Central-Borneo.

For conveniences sake I have adopted in the present list, with but a few exceptions, the systematical arrangement used by Count Salvadori in his »Catalogo sistematico degli Uccelli di Borneo», published in »Annali del Museo Civico di Storia Naturale di Genova, 1874», which excellent work, treating of 392 species, may still be considered the most important publication on this subject ¹⁾.

Another review of the birds of Borneo, enumerating 472 species, has been published by Dr. Vorderman under the title: »Liste des Oiseaux de Borneo» in *Natuurkundig Tijdschrift van Nederlandsch Indië*, Vol. XLVI, afl. 3 (1887).

A very important review of the birds of Borneo, worked up to date, is A. H. Everett's »List of the Birds of the Bornean Group of Islands» in the *Journal of the Straits Branch Royal Asiatic Society*, 1889, pp. 91—212, with map ²⁾. This list treats of not less than 570 species, a good number of which however are restricted to the island of Palawan, an island which cannot readily be understood as belonging to the »Bornean group of Islands». Since the issue of this useful publication, very successful explorations have been made by Mr. Charles Hose and also by Mr. Everett in the Baram valley and the mountainous interior of Sarawak. Especially in this latter region the work of these indefatigable explorers was crowned with enormous success, especially with regard to the great number of new species discovered in the dense and inaccessible mountain-forests (Mount Penrisen, Mount Kalulong, Mount Mulu, Mount Dulit and other mountains with an elevation of more than 1000 meter above the level of the sea).

As I already pointed to in my above-mentioned introduction, I was able to state some of those special moun-

1) This work is quoted in the following list under the abbreviated form of »Salvad. Ucc. Born.»

2) Quoted hereafter as »Everett, L. B. Born.»

tain-forms, such as *Calyptomena Hosei*, *Cyanops monticola*, *Malacopteron kalulongae*, *Rhinomyias ruficrissa*, *Mesolophus (Rubigula) montis*, *Hemivus connectens*, *Staphidia Everetti*, *Turdinulus exsul* and others in the forests of Mount Kenepai and Liang Koeboeng, and we may be quite sure now that this special ornis of this more elevated zone of Borneo is quite the same on all the mountains of the island, and that these special forms are represented by closely allied forms on the mountains of Malacca, Sumatra and Java.

Falconidae.

1. *Microhierax fringillarius*.

Falco fringillaris Drap. Dict. Class. d'Hist. Nat. VI, p. 412, pl. V (1824).

Hierax coerulescens Salvad. Ucc. Born. p. 3.

Microhierax coerulescens Everett, L. B. Born. p. 185.

Three specimens from Smitau, another from the Mendalam River (Dr. Nieuwenhuis) and another from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99). — Iris, bill and feet black.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

2. *Polioaetus ichthyaetus*.

Falco ichthyaetus Horsf. Trans. Linn. Soc. XIII, p. 136 (1822).

Polioaetus ichthyaetus Salvad. Ucc. Born. p. 6; Sharpe, Ibis 1889, p. 73; Everett, L. B. Born. p. 183.

Two adult females from the Sibau River. — Iris chrome-yellow, bill leaden blue, cere lemon yellow, inside of mouth pale flesh-color, feet bluish gray.

Hab. South-eastern Asia and the Sunda Islands (Celebes included).

Annotations of Mr. von Berchtold: »Ein gewandter und scheuer Vogel. Sein Gesicht und Gehör sind sehr scharf, der Flug leicht, doch wenn es sein muss, schnell, gewöhnlich aber langsam. Das schneckenförmige Steigen und das Schweben ohne sichtbare Körperbewegung bietet ein schönes Schauspiel. Den grössten Theil des Tages ruht er auf einem

grossen Baume in der Nähe des Flussufers, wo er auch die Nacht zubringt, einsam und ungesellig. Seine Nahrung besteht hauptsächlich aus Fischen. Da am frühen Morgen die Fische sich mehr in der Tiefe aufhalten und erst später an die Oberfläche kommen, scheint dieser Vogel die Jagd erst spät zu beginnen und demzufolge lange zu schlafen''.

3. *Polioaetus humilis*.

Falco humilis Müll. & Schleg. Verh. Nat. Gesch. Zool. Aves, p. 47, pl. 6 (1839—44).

Polioaetus humilis Salvad. Ucc. Born. p. 6; Everett, L. B. Born. p. 183.

An adult female from Nanga Raoen and two males and a female from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99). — Iris yellowish white, bill horny blue, tip black, feet bluish white.

Hab. Malay Peninsula, Sumatra, Borneo and Celebes.

4. *Spilornis baha*.

Falco baha Daud. Traité d'Orn. II, p. 43 (1800).

Spilornis baha Salvad. Ucc. Born. p. 7; Sharpe, Ibis 1889, p. 71; Everett, L. B. Born. p. 182.

Spilornis pallidus Wald. Ibis 1872, p. 363; Sharpe, Ibis 1889, p. 72; Everett, L. B. Born. p. 182.

An adult male from Mount Kenepai and another from the Bruny River (Upper Mahakkam). — Iris orange-yellow, bill blue, cere and bare space on the face chrome-yellow, feet orange-yellow. Wing 14 inches. — Contents of the crop: Locusts, of the stomach: a Snake.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

After having compared our two specimens with those from different localities in the Leyden Museum and with the numerous specimens from Java, contained in the Collection of Dr. Vorderman, I am unable to recognize *Sp. pallidus* Walden as a distinct species. Amongst the specimens from Java there are some which by no means could be considered to be anything but *Sp. pallidus*, while this

species, according to the opinion of all recent ornithologists, is restricted to Borneo.

5. *Baza borneensis*.

Baza Jerdoni Salvad. (nec Blyth) Ucc. Born. p. 11; Everett, L. B. Born. p. 184.

Baza borneensis Brüggemann, Abh. Nat. Ver. Brem. V (1878), p. 47 (nom. nud.); Sharpe, Ibis 1893, p. 557 (description of the types).

Baza magnirostris Schleg. Ois. Ind. Néerl., Accipitres, p. 75, pl. 28, fig. 5; id. Mus. P. B. Revue Accipitres, p. 135 (1873).

An adult male from Poelau. — Iris orange-yellow, bill and cere black, lower mandible blue, feet orange-yellow.

H a b. Borneo.

The present specimen as well as that from Borneo, mentioned by Schlegel as *B. magnirostris*, agree fully with the description given by Sharpe.

6. *Haliastur intermedius*.

Haliastur intermedius Gurney, Ibis 1865, p. 28; Sharpe, Ibis 1889, p. 74, Everett, L. B. Born. p. 183.

Haliastur indus Salvad. Ucc. Born. p. 12.

Two adult males from the Sibau River and a female from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99). — Iris in one specimen pale brown, in the other chrome-yellow; bill pale bluish green, paler at the tip, cere and feet sulphur-yellow.

H a b. South-eastern corner of Asia and the Sunda Islands.

7. *Spizaetus alboniger*.

Nisaetus alboniger Blyth, Journ. As. Soc. Beng. XIV, p. 173 (1845).

Spizaetus alboniger Salvad. Ucc. Born. p. 14; Everett, L. B. Born. p. 181.

An adult female from Roema Manoal. — Iris yellow, bill black, feet yellow.

H a b. Malacca, Nias and Borneo.

8. *Ninox scutulata*.

Strix scutulata Raffl. Trans. Linn. Soc. XIII, p. 280 (1822).

Strix hirsuta Temm. Pl. Col. I, pl. 289.

Ninox scutulata Sharpe, Cat. B. Br. Mus. II, p. 156; Everett, L. B. Born. p. 179.

Ninox borneensis (Bp.) Salvad. Ucc. Born. p. 18.

Male and female from the Upper Mahakkam (Coll. Dr. Nieuwenhuis, 1898).

Hab. South Eastern Asia, from the Himalayas through India and Ceylon eastward to Japan, and southward through Malakka to Sumatra and Borneo.

Bubonidae.9. *Scops lempiji*.

Strix lempiji Horsf. Trans. Linn. Soc. XIII, p. 140 (1822).

Scops lempiji Salvad. Ucc. Born. p. 19; Sharpe, Ibis 1889, p. 79; Everett, L. B. Born. p. 178.

An adult male (brown phase) from Pontianak (Schaedler), and a specimen from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99). — Iris brown, bill yellowish white, feet bluish white.

Hab. Malay Peninsula and the Sunda Islands.

10. *Bubo orientalis*.

Strix orientalis Horsf. Trans. Linn. Soc. XIII, p. 140 (1822).

Bubo sumatranus Salvad. Ucc. Born. p. 19.

Bubo orientalis Sharpe, Ibis 1889, p. 76; Everett, L. B. Born. p. 178.

An adult female from Mount Liang Koeboeng. — Iris dark brown, bill and cere yellow, feet yellow.

Hab. Malay Peninsula, Sumatra, Banka and Borneo.

11. *Syrnium leptogrammicum*.

Strix leptogrammica Temm. Pl. Col. II, pl. 525 (1831).

Ciccaba leptogrammica Salvad. Ucc. Born. p. 20.

Syrnium leptogrammicum Sharpe, Ibis 1889, p. 81; Everett, L. B. Born. p. 179.

A nestling from Long Bloe (Upper Mahakkam). — Iris

brown, bill pale blue, feet gray. The specimen is in full down of a pale bay color, while the quills and tail-feathers are showing the barred appearance of the adult stage. — Contents of stomach: Spiders (von Berchtold).

Hab. Borneo.

12. *Phodilus badius*.

Strix badia Horsf. Trans. Linn. Soc. XIII, p. 139 (1822).

Phodilus badius Salvad. Ucc. Born. p. 21; Everett, L. B. Born. p. 178.

An adult male from Poetoes Sibau, and a female from Long Bloe (Upper Mahakkam). — Iris brown, bill yellowish white, cere rosy white, feet pale flesh-color. — Contents of stomach: remnants of a large nocturnal butterfly (von Berchtold).

Hab. Ceylon, and from the Eastern Himalayas through Burmah and the Malay Peninsula to Nias, Sumatra, Java and Borneo.

13. *Glaucidium sylvaticum*.

Plate 13.

Athene sylvatica Bp. Consp. I, p. 40 (Type in Mus. Lugd.), 1850.

Glaucidium sylvaticum Sharpe, Cat. B. Br. Mus. II, p. 215; Salvad. Ann. Mus. Civ. Stor. Nat. Genova, XIV, p. 174 (1879).

Glaucidium borneense Sharpe, Ibis 1893, p. 549 (Mount Kalulong), p. 562 (Kina Balu).

An adult male from Mount Liang Koeboeng (780 m. above the level of the sea). — Iris sulphur-yellow, bill and feet greenish yellow.

This rare and interesting species, probably a true mountain-form, was until lately only known from the typical specimen, collected by S. Müller, and two others, collected by Beccari in 1878, all three on the slopes of Mount Singalang, Western Sumatra. There is not the least difference to be found between this Bornean specimen and the type, neither in size nor in color, and a comparison of Dr. Sharpe's above quoted description of *G. borneensis* convinced me

that the birds described under that new name belong to *G. sylvaticum*.

Hab. Sumatra and Borneo.

Psittacidae.

14. *Palaeornis longicauda*.

Psittacus longicauda Bodd. Tabl. Pl. Enl. p. 53 (1783).

Palaeornis longicauda Salvad. Ucc. Born. p. 22; Everett, L. B. Born. p. 177; Sharpe, Ibis 1890, p. 1.

Several males and females, shot out of a great number at Smitau, and a specimen from Pontianak (Moret). — Iris light yellow, bill red, lower mandible brown, feet gray.

Hab. The Malay Peninsula, Sumatra, Billiton, Borneo and Labuan.

15. *Loriculus galgulus*.

Psittacus galgulus Linn. Amoen. Acad. IV, p. 236 (1754).

Loriculus galgulus Salvad. Ucc. Born. p. 26; Everett, L. B. Born. p. 177; Sharpe, Ibis 1890, p. 1.

A great number of specimens from Pontianak, Sanggau, Roema Manoeal, Mount Liang Koeboeng, Poelau and Bruny River (Upper Mahakkam). — Iris grayish brown, bill black, feet wax-yellow to grayish brown.

Hab. Malay Peninsula, Sumatra, Nias, Banka and Borneo.

Trogonidae.

16. *Harpactes Diardi*.

Trogon Diardi Temm. Pl. Col. N^o. 541 (1832).

Pyrotrogon Diardi Salvad. Ucc. Born. p. 28.

Harpactes Diardi Everett, L. B. Born. p. 166; Sharpe, Ibis 1890, p. 3.

Seven specimens from the forests of Mounts Kenepai and Liang Koeboeng. — Iris red, bare skin round the eye and the angle of the mouth purplish, bill cobalt, ridge, tip and edge of upper mandible black, feet flesh-color.

Hab. Malay Peninsula, Sumatra and Borneo.

17. *Harpactes kasumba*.

Trogon kasumba Raffl. Trans. Linn. Soc. XIII, p. 282 (1822).

Pyrotrogon kasumba Salvad. Ucc. Born. p. 29.

Harpactes kasumba Everett, L. B. Born. p. 166; Sharpe, Ibis 1890, p. 3.

Eight specimens from the Mounts Kenepai and Liang Koeboeng, one from Long Bloe (Upper Mahakkam), and a male and two females from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99). — Iris dark grayish brown, naked skin round the eye and round the base of the bill, and the entire bill ultramarine, ridge and tip of the upper mandible black, feet purplish gray. — Contents of stomach: spiders.

Hab. Malay Peninsula, Sumatra and Borneo. In the Kapoeas region it seems to live in the mountain forests only, while it is mentioned by Sharpe (l. c.) as a lowland-bird.

18. *Harpactes Duvaucelii*.

Trogon Duvaucelii Temm. Pl. Col. N^o. 291 (1824).

Pyrotrogon Duvaucelii Salvad. Ucc. Born. p. 29.

Harpactes Duvaucelii Everett, L. B. Born. p. 166; Sharpe, Ibis 1890, p. 3.

A great number of specimens from Mounts Kenepai and Liang Koeboeng, Nanga Raoen and Poelau, and from the Upper Mahakkam. — Iris dark brown, eyelid purplish, bare skin above cobalt, at the base of the bill indigo, bill black, angle of mouth and bill indigo-blue, culmen and tip of bill black, feet purplish blue.

Hab. Malay Peninsula, Sumatra, Billiton and Borneo.

19. *Harpactes orrhophaeus*.

Pyrotrogon orrhophaeus Cab. & Heine, Mus. Hein. IV, p. 156 (1863).

Harpactes orrhophaeus Grant, Cat. B. Br. Mus. XVII, p. 493.

Two adult males from Mount Liang Koeboeng. — Iris dark brown, bare skin above the eye sea-green, bill sky-blue, culmen and tip black, feet purplish.

Hab. Hitherto only stated from the southern part of the Malay Peninsula, while it is new for the ornis of Borneo.

Capitonidae.20. *Chotorhea chrysopsis*.

Megalaema chrysopsis Goffin, Mus. P. B., Buccones, p. 15 (1863);
 Everett, L. B. Born. p. 167; Sharpe, Ibis 1890, p. 4.
Chotorhea chrysopsis Salvad. Ucc. Born. p. 32; Shelley, Cat. B. Br.
 Mus. XIX. p. 59.

A great number of specimens from Mounts Kenepai and Liang Koeboeng, Nanga Raoen, Poetoes Sibau, Poelau and the Upper Mahakkam. — Iris reddish brown, bill black (in the female the base of lower mandible greenish horn-color), feet olive-green.

From the above mentioned localities may be seen that this species is found in the plain as well as in the mountain forests. Captain Shelley in his above quoted Catalogue allows only subspecific rank to this Bornean representative of *C. chrysopogon*, but our bird is so constantly distinct by its smaller size and the bright yellow forehead that it fully merits to be considered a quite distinct species.

Hab. Throughout Borneo.

»Der Ruf des Vogels ist ein kurzes, rasch hinter einander ausgestossenes kuko, kuko, kuko“.

21. *Chotorhea versicolor*.

Bucco versicolor Raffl. Trans. Linn. Soc. XIII, p. 284 (1822).
Chotorhea versicolor Salvad. Ucc. Born. p. 33.
Chotorea versicolor, var. *borneensis* W. Blas. Verh. z. b. Ver. Wien,
 XXX, p. 25.
Megalaema versicolor Everett, L. B. Born. p. 167; Sharpe, Ibis 1890,
 p. 4.

A great number of adult specimens from Pontianak, Sanggau, Roema Manoeal, Nanga Raoen, Poelau and Upper Mahakkam. — Iris dark brown, bill black, feet dirty olive-green. — Contents of stomach: rests of the fruits of *Urostigma*. — A very common forest-bird.

Hab. Malay Peninsula, Sumatra and Borneo.

22. *Cyanops mystacophanos*.

Bucco mystacophanos Temm. Pl. Col. III, N^o. 315 (1824).

Chotorea mystacophanus Salvad. Ucc. Born. p. 34, pl. 1.

Megalaema mystacophanus Goffin, Mus. P. B. Buccones, p. 18;
Everett, L. B. Born. p. 167.

Megalaema mystacophanes Sharpe, Ibis 1890, p. 4.

Cyanops mystacophanes Shelley, Cat. Birds Br. Mus. XIX, p. 72.

Nineteen adult males and thirteen females from Sanggau, Roema Manoel, Mounts Kenepai and Liang Koeboeng, Nanga Raoen and Poelau and thirteen from Long Bloe (Upper Mahakkam). — Iris dark brown, eyelid olive-green, bill entirely black in the males, black with the base of lower mandible greenish white in the female; feet dirty olive-green. — Contents of stomach: rests of the fruits of *Urostigma*.

Hab. Malay Peninsula, Sumatra and Borneo.

The question whether the adult females are similar in color to the adult males or not, has hitherto never satisfactorily been settled, though the species is very common in the forest-regions of the above mentioned countries.

Goffin (l. c.) considers the adult female to be of the same color as the adult male, but this opinion is solely based upon a specimen collected by Schwaner and mentioned as a female, while there are strong reasons to consider it an adult male.

Salvadori (l. c.) does not share the opinion of Goffin's, the collections of Doria and Beccari containing not a single specimen in full color (i. e. with golden yellow fore-head) sexed by the collectors as a female.

Shelley (l. c.) on the contrary, says that the adult female does not differ from the adult male, but amongst the numerous specimens enumerated in the Catalogue, there is only a single female (specimen *c'*) mentioned as adult, thus with yellow fore-head, while all the other numerous authentic females are considered to be immature.

The mentioned two »females" in the Leyden- and in British Museum are, in fact, the only specimens in full color which are mentioned to be females, while in littera-

ture the great number of females are all considered to be immature. Besides the registered specimens in the Leyden Museum the one in Goffin's Catalogue and my own series, I have before me a number of specimens from Sumatra, collected by Vorderman, Klaesi and Hagen, and all the specimens marked as males have the fore-head more or less golden yellow while this is not the case in any of those marked as females.

After thoroughly considering these heavily weighing facts I come to the conclusion that the adult female of this species may constantly be distinguished from the adult males by the following characters: Chin yellowish green (not red), shading off into the blue throat, basal part of the moustachial streak blue (not yellow), fore-head green, somewhat shaded with blue (not golden yellow), extreme base of fore-head tinged with yellow, hinder part of the superciliary streak blue (not black), the occipital patch duller red and less extended than in the male, base of lower mandible whitish instead of black, size alike in both sexes. Immature birds may be recognized by the less overlapping edge of the basal part of the upper mandible. Young birds of both sexes are much like the adult females, but have the chin tinged with olive-gray, and the blue on throat, angle of mouth, under the eye and on the hind part of the superciliary streak is more or less absent, while the red occipital patch is more or less wanting.

In the nearly adult male the green chin is intermixed with red feathers and the red patch on the sides of the throat begins to show very early in males and females.

23. *Cyanops Henrici*.

Bucco Henrici Temm. Pl. Col. III, N^o. 524 (1831).

Megalaelma Henrici Sharpe, Ibis 1879, p. 239; Everett, L. B. Born. p. 168.

A probably immature male from Nanga Raoen, and three females from Long Bloe (Upper Mahakkam). — Iris brown, bill black, feet dirty olive-green. The specimen

from Nanga Raoen wants the blue crown-patch and the red collar on the hind neck, while the yellow on the front is not so deep as in adult birds and not extending over the sides of the crown; the blue color on the throat is paler and less extended, and the red patches on the sides of the throat are smaller. The whole bird is much smaller than the adult and even smaller than the young specimens from Sumatra, and the bill much shorter, the culmen measuring only two cm. instead of 2,5. Having no adult male from Borneo to compare with, I dare not say that the Bornean specimens as a rule have the bill shorter than those from the Malay Peninsula and Sumatra.

H a b. Malay Peninsula, Sumatra and Borneo.

24. *Cyanops monticola*.

Cyanops monticola Sharpe, Ann. & Mag. Nat. Hist. 1888, p. 424; Everett, L. B. Born. p. 168; Sharpe, Ibis 1890, p. 5.

Two males and a female from Mount Liang Koeboeng. — Iris reddish brown, bill in male entirely black, in the female the upper mandible only black, lower mandible green, feet green. The males agree fully with Dr. Sharpe's description, the female differs from the male in having the lower mandible green (two females from Mr. Hose's collection agree exactly with mine).

H a b. Mountain-regions of Borneo (Kina Balu, Mt Dulit, Liang Koeboeng).

25. *Mesobucco Duvauceli*.

Bucco Duvauceli Less. Traité d'Orn. p. 164 (1831).

Xantholaema Duvauceli Salvad. Ucc. Born. p. 38; Everett, L. B. Born. p. 168; Sharpe, Ibis 1890, p. 5.

Mesobucco Duvauceli Sharpe, Ibis 1890, p. 281.

A great number of specimens from Roema Manoeal, Mount Kenepai, Nanga Raoen, Poetoes Sibau, Poelau and Long Bloe (Upper Mahakkam). — Iris dark brown, bill black, feet yellowish green.

H a b. Malay Peninsula, Sumatra and Borneo.

26. *Mesobucco eximius*.

Mesobucco eximius Sharpe, Ibis 1892, pp. 324 and 441, pl. XI;
Hose, Ibis 1893, p. 414.

An adult male from Mount Liang Koeboeng. — Iris dark brown, bill black, feet yellowish green.

Hab. Mountain-regions of Borneo, where it has hitherto only been recorded from several mountains of Sarawak; it seems to be exceedingly a mountain-form.

27. *Calorhamphus fuliginosus*.

Micropogon fuliginosus Temm. Pl. Col. III, livr. 83 (1830).

Calorhamphus fuliginosus Goff. Mus. P.-B. Buccones, p. 73 (part.);
Salvad. Ucc. Born. p. 39; Everett, L. B. Born. p. 168; Sharpe,
Ibis 1890, p. 6.

A great number of specimens from Roema Manoeal, one from Mount Liang Koeboeng, one from Nanga Raoen and one from Long Bloe. — Iris brown, bill of the males grayish black, of the females flesh-color, feet coral-red.

This species is usually found in great flocks, feeding on fruits in high forest trees.

Hab. Borneo generally, representing there *C. Hayi* from the Malay Peninsula and Sumatra.

Picidae.28. *Jyngipicus auritus*.

Tripsurus auritus Eyt. Ann. and Mag. Nat. Hist. XVI, p. 229 (1845).
Jyngipicus auritus Everett, L. B. Born. p. 154; Sharpe, Ibis 1890, p. 6.

Three specimens from Pontianak. — Iris red, bill black, feet grayish green.

Hab. From Cochin China down through Siam and the Malay Peninsula to Sumatra, Java and Borneo.

29. *Chrysocolaptes validus*.

Picus validus Temm. Pl. Col. 378 ♀, 402 ♂ (1825).

Nyctolepes validus Salvad. Ucc. Born. p. 43; Everett, L. B. Born. p. 154; Sharpe, Ibis 1890, p. 6.

Notes from the Leyden Museum, Vol. XXI.

A male and a female from Poetoes Sibau and Mount Liang Koeboeng, and three males and two females from the Upper Mahakkam (Dr. Nieuwenhuis, winter 1898—99).

Iris of the male reddish brown, upper mandible brown, lower mandible yellow, feet grayish green, of the female iris ochraceous, upper mandible gray, lower mandible whitish, feet gray.

Hab. Malay Peninsula and the Sunda Islands.

30. *Hemicercus sordidus*.

Dendropicus sordidus Eyt. Ann. & Mag. Nat. Hist. XVI, p. 229 (1845).

Hemicercus concretus Bp. Consp. I, p. 129; Salvad. Ucc. Born. p. 47.

Hemicercus sordidus Salvad. Ucc. Born. p. 46; Everett, L. B. Born. p. 155; Sharpe, Ibis 1890, p. 7.

Five specimens from Pontianak, Smitau, Roema Manoeal, Poetoes Sibau (Nieuwenhuis) and Poelau, and three specimens from the Upper Mahakkam.

Iris reddish brown, bare space round the eye ashy gray, bill black, feet dark gray. — Contents of stomach: small white ants.

Hab. Malay Peninsula, Sumatra, Banka and Borneo, where it is generally distributed.

A probably not quite adult male from Smitau has the feathers of the flanks conspicuously tipped with fulvous.

31. *Lepocestes porphyromelas*.

Picus porphyromelas Boie, Briefe geschr. aus Ostind. p. 143 (1832).

Lepocestes porphyromelas Salvad. Ucc. Born. p. 48; Everett, L. B.

Born. p. 155; Sharpe, Ibis 1890, p. 7.

A male and three females from Mount Kenepai, a female from Mount Liang Koeboeng, and a male from the Mahakkam River. — Iris blood-red, bill yellow, feet dark gray.

Hab. From Tenasserim through the Malay Peninsula to Sumatra and Borneo, where it is found throughout the island.

32. *Gecinus puniceus*.

Picus puniceus Horsf. Trans. Linn. Soc. XIII, p. 176 (1822).

Notes from the Leyden Museum, Vol. XXI.

Callolophus puniceus Salvad. Ucc. Born. p. 49.

Gecinus puniceus Everett, L. B. Born. p. 156; Sharpe, Ibis 1890, p. 7.

A large series of specimens from Pontianak, Sanggau, Mount Kenepai, Nanga Raoen, Mount Liang Koeboeng and Poelau, and four specimens from the Upper Mahakkam. — Iris blood-red, bare space round the eye sky-blue, bill yellow, ridge and tip black, feet yellowish green. — Contents of stomach: small tree-ants.

Hab. From Tenasserim through the Malay Peninsula to Nias, Sumatra, Java and Borneo.

33. *Chrysophlegma Humii*.

Callolophus mentalis Salvad. Ucc. Born. p. 49.

Chrysophlegma humii Hargitt, Ibis 1889, p. 231; Everett, L. B. Born. p. 155; Sharpe, Ibis 1890, p. 7.

Eight specimens from Pontianak, Nanga Raoen, and Mount Liang Koeboeng. — Iris reddish brown, bare space round the eye and angle of mouth green, bill black, lower mandible lead-color, feet green.

It is a rather peculiar fact that amongst the eight specimens collected there is only one male, and that this specimen has chin and malar stripe as strongly tinged with rufous as the female.

Hab. Malay Peninsula, Sumatra and Borneo.

34. *Chrysophlegma malaccense*.

Picus malaccensis Lath. Ind. Orn. I, p. 241 (1790).

Callolophus malaccensis Salvad. Ucc. Born. p. 50.

Chrysophlegma malaccense Everett, L. B. Born. p. 155; Sharpe, Ibis 1890, p. 7.

Numerous specimens from Pontianak, Smitau, Mount Liang Koeboeng and Poelau (Sibau valley). — Iris blood-red, bill black, lower mandible pale horn-color, feet grayish green.

Hab. From Tenasserim through the Malay Peninsula to Sumatra, Banka and Borneo, where it is common throughout the island.

35. *Hemilophus pulverulentus*.

Picus pulverulentus Temm. Pl. Col. 389 (1826).

Alphonherpes pulverulentus Salvad. Ucc. Born. p. 51; Sharpe, Ibis 1890, p. 8.

Mulleripicus pulverulentus Everett, L. B. Born. p. 156.

Hemilophus pulverulentus Swains. Classif. B. II, p. 309; Hargitt, Cat. B. Br. Mus. XVIII, p. 494.

A male and two females from Pontianak, Nanga Raoen and Poelau, and two from the Mahakkam River. — Iris dark brown, bill whitish horn-color, culmen black, feet bluish gray.

Hab. South-eastern Asia, Malay Peninsula, Sumatra ¹⁾, Java and Borneo.

36. *Gauropicoides Rafflesii*.

Picus Rafflesii Vig. Raffl. Mem., App. p. 669 (1831).

Gauropicoides Rafflesii Salvad. Ucc. Born. p. 54; Everett, L. B. Born. p. 157; Sharpe, Ibis 1890, p. 8.

Eight specimens from Pontianak, Mount Kenepai and Liang Koeboeng. — Iris dark brown, bill black, base of lower mandible gray, feet dirty olive-green.

Hab. Malay Peninsula as far as Tenasserim, Sumatra and Borneo.

37. *Miglyptes grammithorax*.

Miglyptes tristis (nec Horsf.) Salvad. Ucc. Born. p. 56.

Phaiopicus grammithorax Malh. Picidae, II, p. 12, pl. 48, figs. 4 and 5 (1862).

Miglyptes grammithorax Everett, L. B. Born. p. 158; Sharpe, Ibis 1890, p. 8.

Seven specimens (all females!) from Pontianak, Mounts Kenepai and Liang Koeboeng, and Nanga Raoen, and three specimens from the Upper- and Lower Mahakkam. —

1) This species is mentioned in Vorderman, Les Oiseaux de Sumatra, p. 390 (1889), and also in Hargitt's above mentioned Catalogue, but there does not seem to exist any authentic Sumatran specimen in collections.

Iris dark brown, bill black, feet dirty olive-green, soles ochraceous.

Hab. Malay Peninsula north to Tenasserim, Nias, Sumatra and throughout Borneo.

38. *Miglyptes Tukki*.

Picus Tukki Less. Rev. Zool. 1839, p. 167.

Miglyptes Tukki Salvad. Ucc. Born. p. 57; Everett, L. B. Born. p. 158; Sharpe, Ibis 1890, p. 9.

A male and six females from Mount Liang Koeboeng, Nanga Raoen, and Poelau, and a male and four females from the Upper Mahakkam. — Iris reddish brown, bill black, lower mandible greenish horny, feet grayish green, soles ochre.

Hab. Malay Peninsula up to Tenasserim, Nias, Sumatra, throughout Borneo.

39. *Micropternus badius*.

Meiglyptis badius Temm. Mus. Lugd.; Bp. Consp. I, p. 113 (1850).

Micropternus badius Bp. Consp. Voluer. Zygod. p. 9; Salvad. Ucc. Born. p. 58; Everett, L. B. Born., p. 158; Sharpe, Ibis 1890, p. 9.

Five specimens from Pontianak and Mount Liang Koeboeng. — Iris reddish brown, bill black, tip and lower mandible whitish, feet grayish brown.

Hab. Throughout Borneo.

40. *Sasia abnormis*.

Picumus abnormis Temm. Pl. Col. IV, pl. 371, fig. 3 (1825).

Sasia abnormis Salvad. Ucc. Born. p. 60; Everett, L. B. Born. p. 154; Sharpe, Ibis 1890, p. 9.

Eight specimens from Smitau, Mount Kenepai, Mount Liang Koeboeng and Poelau, and five specimens from the Upper Mahakkam. — Iris blood-red, naked skin round the eye pink, upper mandible black, lower greenish yellow, feet orange-yellow, in a specimen from Smitau minium-red.

The female of this species has the forehead similar in color to the sides of the head, while in the male this part

is straw-yellow. An immature specimen (N^o 1500 from Poelau) has the lower surface partly green instead of cinnamon-brown.

Hab. Malay Peninsula, Nias, Sumatra and Borneo.

Indicatoridae.

41. *Indicator archipelagicus*.

Indicator archipelagicus Temm. Pl. Col. pl. 543, fig. 2 (1832); Salvad. Ucc. Born. p. 61; Everett, L. B. Born. p. 169; Sharpe, Ibis 1890, p. 9.

An adult male from Poelau. — Iris red, bill black, base of lower mandible flesh-color, feet grayish brown.

Hab. Malay Peninsula and Borneo.

Cuculidae.

42. *Chalcococcyx xanthorhynchus*.

Cuculus xanthorhynchus Horsf. Trans. Linn. Soc. XIII, p. 179 (1822).
Chrysococcyx xanthorhynchus Salvad. Ucc. Born. p. 62; Everett, L. B. Born. p. 172 1); Sharpe, Ibis 1890, p. 9.

Chalcococcyx xanthorhynchus Shelley, Cat. B. Br. Mus. Vol. XIX, p. 289.

A male and two females from the Upper Mahakkam (Dr. Nieuwenhuis, 1899).

Hab. South-western part of the Continent through the Malay Peninsula to Sumatra, Borneo and Java and the Andamans.

43. *Surniculus lugubris*.

Cuculus lugubris Horsf. Trans. Linn. Soc. XIII, p. 175 (1822).

1) Everett, in a note to *Chrysococcyx xanthorhynchus*, suggests that *Heterococcyx neglectus* (Schleg.) Salvad. Ucc. Born. p. 61, the type of which is in the Leyden Museum, might be a style of *C. xanthorhynchus*, for which reason he does not enumerate it in his List as a distinct species. Shelley, in his above mentioned catalogue, p. 294, adds it, though with a point of interrogation, to the synonymy of *Chalcococcyx basalis*. Dr. Finsch, whom I asked to examine the bird in question, writes me that it is really a good species, allied to *Prodotiscus regulus* Sund. and that *Heterococcyx* of Salvadori is a valid genus. Shelley entirely forgot to mention the genus in his Catalogue.

Surniculus lugubris Salvad. Ucc. Born. p. 63; Everett, L. B. Born. p. 172; Sharpe, Ibis 1890, p. 10.

Three adult specimens from Mount Kenepai, Nanga Raoen and Liang Koeboeng and eight adult specimens from the Upper Mahakkam. — Iris dark brown, bill black, feet purplish, soles ochre-yellow.

Hab. From India and Ceylon to South China, Southern Philippines, Borneo, Sumatra and Java (Shelley, Cat. B. Br. Mus. XIX, p. 227, mentions Batchian as habitat of this species, but this is undoubtedly an error, this species being represented on that island by *S. Musschenbroeki* Meyer).

44. *Penthoceryx pravatus*.

Cuculus pravata Horsf. Trans. Linn. Soc. XIII, p. 179 (1822).

Penthoceryx pravatus Salvad. Ucc. Born. p. 63; Sharpe, Ibis 1890, p. 10.

Cacomantis pravata Bütt. N. L. M. 1887, p. 27.

Cuculus Sonnerati Everett, L. B. Born. p. 170; Shelley, Cat. B. Br. Mus. XIX, p. 262.

An adult male (N^o 1002) from Mount Liang Koeboeng. — Iris brown, bill black, lower mandible horny gray, feet yellowish green.

Hab. South-eastern Asia, Malay Peninsula and Sunda Islands.

This species is mentioned, as quoted above, under the name of *Cuculus Sonnerati* by Everett and Shelley. I feel, however, obliged to maintain the generic name *Penthoceryx* for the two species *Sonnerati* and *pravatus*, convinced as I am that these two species cannot be placed in the genus *Cuculus* proper. This latter is always characterized by more or less pronounced longitudinal shaft-spots on at least some of the tail-feathers, which character is quite peculiar to this genus only, and as it is not found in *Cacomantis Sonnerati* and *C. pravatus*, which two species are, moreover, much smaller than the average size of *Cuculus*, I do not hesitate to place them under the generic name *Penthoceryx* as proposed by Cabanis and Heine and later on maintained by Salvadori and other ornithologists.

The genus *Penthoceryx* is closely allied to *Cacomantis*, but differs from it in having the barrings on the tail, as far as they are present, always placed transversely, i. e. in a right angle to the shaft, while in all the species of *Cacomantis* the barrings on the tail-feathers, as far as they are present, are placed obliquely, which character it has in common with the square-tailed genus *Surniculus*.

As to the identity of the species *pravatus* with *Sonnerati*, I cannot agree with the view of Shelley's, and prefer to keep both species separate. *P. Sonnerati* is a much larger bird than *P. pravatus*, its wing measuring 5 inches, while in the Malayan birds (*P. pravatus*) the largest specimen at hand measures but 4,3 inches.

45. *Cacomantis merulinus*.

Cuculus merulinus Scop. Del. Flor. et Faun. Insubr. II, p. 89 (1786).
Cacomantis merulinus Salvad. Ucc. Born. p. 64; Everett, L. B. Born. p. 172; Sharpe, Ibis 1890, p. 10.

An adult and a young female from Banjok, a Dyak village near the great falls of the Mahakkam River (Dr. Nieuwenhuis). — Iris pale ochraceous, bill dark gray, feet gray.

Hab. South-eastern Asia through the Malay Peninsula and the whole Malay Archipelago.

46. *Hierococcyx fugax*.

Cuculus fugax Horsf. Trans. Linn. Soc. XIII, p. 178 (1822).
Hierococcyx fugax Salvad. Ucc. Born. p. 65; Everett, L. B. Born. p. 171; Sharpe, Ibis 1890, p. 10.

An immature male from Mount Kenepai, and three males and two females from the Upper Mahakkam. — Iris chestnut encircled with white, bill black, lower mandible at the base, nostrils and eyelid chrome-yellow, feet sulphur-yellow. Males and females quite similar.

Hab. Whole eastern Asia, Malay Peninsula, Sumatra, Java, Borneo and the Philippines.

47. *Cuculus intermedius*.

Cuculus intermedius Vahl, Serv. of Natur. Selsk. IV, p. 58 (1797);
Shelley, Cat. B. Br. Mus. XIX, p. 252.

Cuculus canorinus (Cab. & Heine) Salvad. Ucc. Born. p. 67.

Cuculus striatus (Drap.) Everett, L. B. Born. p. 170.

An adult male from the Upper Mahakkam (Dr. Nieuwenhuis 1898).

Hab. From Eastern and South Eastern Asia through the Malay Archipelago and New Guinea to Australia.

48. *Coccytes coromandus*.

Cuculus coromandus L. Syst. Nat. I, p. 171 (1766).

Coccytes coromandus Salvad. Ucc. Born. p. 67; Everett, L. B. Born. p. 173; Sharpe, Ibis 1890, p. 12; Shelley, Cat. B. Br. M. XIX, p. 214.

An adult male (Dr. Nieuwenhuis, Upper Mahakkam, 6 February 1899).

Hab. From India and Ceylon through South-east Asia to the Sunda Islands and the Philippines.

49. *Rhinortha chlorophaea*.

Cuculus chlorophaeus Raffl. Trans. Linn. Soc. XIII, p. 288 (1822).

Rhinortha chlorophaea Salvad. Ucc. Born. p. 69; Everett, L. B. Born. p. 173; Sharpe, Ibis 1890, p. 13.

A great number of specimens from Pontianak, Roema Manoeal, Nanga Raoen, Mount Liang Koeboeng, Poelau, and the Upper Mahakkam. — Iris brown, bill and bare space round the eye green, feet gray. The males rusty red, the females gray.

Hab. From Southern Tenasserim through the Malay Peninsula to Sumatra and Borneo.

50. *Rhopodytes borneensis*.

Melias borneensis Bp. Consp. Volucr. Zygod. p. 5 (1854).

Rhopodytes borneensis Salvad. Ucc. Born. p. 72; Everett, L. B. Born. p. 174.

An adult female from Mount Kenepai. — Iris pale blue,

bare space round the eye crimson, bill green, feet bluish gray.

Hab. Borneo, from Sarawak to Banjarmassing.

51. *Rhopodytes sumatranus*.

Cuculus sumatranus Raffl. Trans. Linn. Soc. XIII, p. 287 (1822).

Rhopodytes sumatranus Salvad. Ucc. Born. p. 73; Everett, L. B. Born. p. 174.

Poliococcyx sumatranus Sharpe, Ibis 1890, p. 13.

Eleven specimens from Smitau, Roema Manoeal, Poetoes Sibau, and Banjok on the Mahakkam River. — Iris whitish blue, bare skin round the eye minium-red, bill green, feet bluish gray.

Hab. From Southern Tenasserim through the Malay Peninsula to Sumatra, Java and Borneo.

52. *Phoenicophaes microrhinus*.

Phoenicophaeus erythrognathus Bp. Consp. I, p. 98 (1850).

Ramphococcyx erythrognathus Salvad. Ucc. Born. p. 74; Everett, L. B. Born. p. 174.

Rhopodytes erythrognathus Sharpe, Ibis 1890, p. 12.

Urococcyx erythrognathus Shelley, Cat. B. Br. Mus. XIX, p. 398.

Phoenicophaes microrhinus Berlepsch, Novit. Zool. 1895, p. 70.

A great series, collected at Roema Manoeal, Mount Kenepai, Mount Liang Koeboeng, Poelau, Poetoes Sibau, and on the Upper Mahakkam. — The color of the iris differs much in the different specimens, but this difference must be considered to be absolutely individual, and not due to either sex or age, as, for instance, out of two adult males both obtained on the same place and at the same date, one has the iris bluish white, while in the other it is blood-red. Amongst the specimens collected in Borneo, there are some with the iris pure white, bluish white, orange-yellow, orange-red, fiery red and blood-red. The bill is pea-green («plantain-green” as I called it in my annotations), lower mandible (with the exception of the green tip) and the lower corner of the base of the upper

mandible red, inside of mouth and tongue black, naked part round the eye scarlet; feet grayish blue, sometimes tinged with green, soles ochraceous.

Hab. Throughout Borneo, in the plains as well as in the mountain-forests. Count von Berlepsch, in his above quoted paper, was the first who stated the constant difference of the Bornean specimens from those from Malacca and Sumatra, which hitherto had been united under the specific name of *Ramphococcyx erythrognathus*. The principal differences consist in the shape of the nostrils, which are oblong in the Bornean specimens while they are circular in the birds from Sumatra and Malacca, and in the length of the red terminal part of the central tail-feathers which is constantly less in Bornean birds than in those from Sumatra and the Malay Peninsula. The length of wing and tail, said by von Berlepsch to be inferior in Bornean birds, does not differ constantly in the rich material at hand from Borneo and Sumatra.

Count von Berlepsch, in his above quoted paper, also mentions the reasons why he re-unites the genera *Ramphococcyx*, *Rhinococcyx* and *Urococcyx*, and *Dryococcyx* with *Phoenicophaes*, and I fully agree with the view based upon his arguments. I also confirm the difference in the sex of the present species, which holds well in all the numerous specimens which I have collected and sexed myself during my stay in Borneo, although this is not the case with the three specimens from the Upper Mahakkam, which are probably wrongly sexed by von Berchtold.

53. *Zanclostomus javanicus*.

Phoenicophaes javanicus Horsf. Trans. Linn. Soc. XIII, p. 178 (1822).
Zanclostomus javanicus Salvad. Ucc. Born. p. 75; Everett, L. B. Born. p. 175; Sharpe, Ibis 1890, p. 13.

An adult male from Roema Manoeal. — Iris dark brown, bill coral-red, feet gray.

Hab. Malay Peninsula, Sumatra, Java and Borneo, where it is distributed over the whole island.

54. *Carpococcyx radiatus*.

Calobates radiceus Temm. Pl. Col. 538 (1832).

Calobates radiatus Temm. Tabl. Méth. p. 53 (1838).

Carpococcyx radiatus Salvad. Ucc. Born. p. 76; Everett, L. B. Born. p. 175; Finsch, N. L. M. XX (1898), p. 98.

An adult female from Dingey, on the Upper Long Bloe River (Coll. Dr. Nieuwenhuis). — »Iris bluish gray, bill pea-green, naked parts of the face olive-green, feet olive-green. — Contents of the stomach: beetles and other insects" (von Berchtold).

Hab. Borneo, spread over the whole island.

55. *Centropus sinensis*.

Polophilus sinensis Steph. Gen. Zool. IX, p. 51 (1815).

Centrococcyx eurycercus Salvad. Ucc. Born. p. 78; Everett, L. B. Born. p. 175; Sharpe, Ibis 1890, p. 13.

Centropus sinensis Shelley, Cat. B. Br. Mus. XIX, p. 343.

Five specimens collected by Dr. Nieuwenhuis on the Upper Mahakkam. — Iris carmin, bill and feet black. A young, not yet full-grown specimen does not differ in color from the adult.

This bird is found nesting in rice-fields, and many superstitious believes are annexed to it (von Berchtold). — Contents of the stomach: grasshoppers.

Hab. From British India and Ceylon throughout South-eastern Asia and the Malay Peninsula to the Sunda-Islands and the Southern Philippines.

Bucerotidae.56. *Anorrhinus galeritus*.

Buceros galeritus Temm. Pl. Col. 520, p. 78 (1824).

Anorrhinus galeritus Salvad. Ucc. Born. p. 79; Everett, L. B. Born. p. 163; Sharpe, Ibis 1890, p. 16.

An immature male (N° 438) from Mount Kenepai, a nestling (N° 1325), showing the brown color of the breast, from Nanga Raoen, and an adult male from the Upper

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Mahakkam. — Iris whitish yellow, in the nestling gray; bill pea-green, tip rosy, feet greenish gray. In the specimen from the Mahakkam the iris is said to be red.

Hab. From Tenasserim through the Malay Peninsula to Sumatra and Borneo.

57. *Anthracoceros convexus*.

Buceros convexus Temm. Pl. Col. II, p. 82, pl. 530 (♀) (1832).

Hydrocissa convexa Salvad. Ucc. Born. p. 80.

Anthracoceros convexus Everett, L. B. Born. p. 162; Sharpe, Ibis 1890, p. 15.

Two males and a female from the Sibau River. — Iris red in the male, brown in the female, naked space round the eye in both sexes white, bill in the male entirely white, casque very large, white, black at the base like the base of the lower mandible, a broad black band along the lower frontal edge of the casque. In the female the casque is much smaller, with vertical frontal edge, which is black, as also the fore-part of the upper and lower mandible, which latter bears a red patch in front of the black basal part; feet in male and female bluish gray. In a half-grown specimen the iris is gray, the naked parts of face rosy white, bill pale yellowish green, feet bluish gray.

Hab. Malay Peninsula, Nias, Sumatra, Java and Borneo.

58. *Anthracoceros malayanus*.

Buceros malayanus Rafil. Trans. Linn. Soc. XIII, p. 292 (1822).

Hydrocissa malayana Salvad. Ucc. Born. p. 83.

Anthracoceros malayanus Everett, L. B. Born. p. 162; Sharpe, Ibis 1890, p. 16.

Hydrocissa nigrirostris (♀) Salvad. Ucc. Born. p. 84; Vorderman, Natuurk. Tijdschr. Ned. Ind. LI, p. 218 (1891).

An adult male (N° 293) from Roema-Manoeal with white, very strongly developed bill and casque, and with strongly developed pure white superciliary stripe; further a second adult male (N° 1210) from Nanga Raoen, and another N° 134 (Dr. Nieuwenhuis) from Long Bloc (Upper-Mahakkam) with bill and casque white but with ashy gray

eyebrow; a young, not yet fullgrown female with white bill and casque, which latter is but faintly developed, and ashy gray eyebrow, and moreover what I should call a nearly adult female (the sex is thoroughly stated) with black bill and casque, and hardly any trace of a gray superciliary stripe, and the naked skin round the eye and at the base of the lower mandible dark flesh-color (N^o 1392 from Poelau), and an adult female (N^o 78) from the Upper Mahakkam, with black bill, well-developed black casque and very distinct gray superciliary stripe. — Iris in adult and young birds of both sexes reddish brown, bill in adult males yellowish white with black basal edge, in the adult female black, in young birds of both sexes white; feet dark greenish gray.

Salvadori, in his *Uccelli di Borneo*, followed Blyth and others in separating the black-billed birds as a distinct species, a supposition which is followed by Vorderman in his above quoted contribution to the *Ornithology of Sumatra*. I cannot agree with this supposition, but yield to the opinion of Schlegel's who, in his *Catalogue of the Bucerotes*, p. 7, considers the black-billed birds the adult females of *Buceros malayanus*, and the white billed adult birds as the males, while young birds of both sexes should have the bill white. This latter supposition is not in contradiction with the four young birds in the Leyden Museum, which all have the bill white. Mr. Grant, in his *Catalogue of the Bucerotes in the British Museum* (Vol. XVII, p. 369) seems not to agree with the opinion of Schlegel's, as he says that the only difference between male and female is to be found in the color of the superciliary stripe, which should be white in the male and gray in the female. The black bill is considered by him to indicate a transitional stage of immaturity to be found in both sexes, while young birds of both sexes should have white bills. As to the supposition of the black bill being representing a stage of immaturity, I cannot agree with Mr. Grant, nor can I consider the color of the superciliary stripe as a characteristic of

the sexes in this species. As I have mentioned already, one of my adult white billed males has the superciliary stripe white, while in the other it is gray, and the same is the case with the white-billed specimens of this species in the Leyden Museum, while one of these latter has no superciliary stripe at all. The black-billed specimens in the Leyden Museum have, as a rule, the eyebrow gray, but three specimens, one from the Continent, one from Banka and one from Sumatra (the specimen described by Vorderman in his above quoted paper) have broad, pure white eyebrows. For this reason I cannot consider the color of the eyebrow a sexual character. Young birds are easily recognized by having the white terminal part of the tail-feathers spotted with black.

Hab. South-eastern part of the Continent, Sumatra, Banka and Borneo.

59. *Cranorrhinus corrugatus*.

Buceros corrugatus Temm. Pl. Col. II, pl. 531 [?] (1832).

Buceros gracilis Temm. Pl. Col. II, pl. 535 [?] (1832).

Cranorrhinus corrugatus Salvad. Ucc. Born. p. 86; Everett, L. B. Born. p. 163.

An adult male from Poelau and an immature male from the Upper Mahakkam. — Iris blood-red, bare skin round the eye sea-green, bare chin and throat Naples-yellow, bill orange-yellow, base of upper mandible and the entire casque blood-red, feet dark grayish green, soles yellowish gray.

Hab. Malay Peninsula, Sumatra and Borneo.

60. *Buceros rhinoceros*.

Buceros rhinoceros Linn. Syst. Nat. I, p. 153 (1766); Everett, L. B. Born. p. 162; Sharpe, Ibis 1890, p. 14.

Buceros rhinocerooides Salvad. Ucc. Born. p. 87.

Two specimens from Mount Kenepai, one from Mount Liang Koeboeng and a young female from the Upper Mahakkam (November 1898). — Iris in the male red, in the female white, base of bill and casque black, rest of

lower and tip of upper mandible white, central part of upper mandible and front of casque chrome-yellow, rest of casque and lower basal corner of upper mandible coral-red, feet yellowish green; the male is moreover characterized by a black line running from the nostril along the lower part of the horn, separating the red from the yellow parts of the casque.

Hab. Malay Peninsula, Sumatra and Borneo, where it is found in the forests of the plains as well as in the higher mountain-regions.

61. *Rhinoplax vigil*.

Buceros vigil Forst. Ind. Zool. p. 40 (1781).

Rhinoplax scutatus Salvad. Ucc. Born. p. 88.

Rhinoplax vigil Everett, L. B. Born. p. 162; Sharpe, Ibis 1890, p. 15.

Several specimens observed along the high rock-walls above my hunting station on Mount Liang Koeboeng.

Hab. Malay Peninsula, Sumatra and Borneo.

62. *Berenicornis comatus*.

Buceros comatus Raffl. Trans. Linn. Soc. XIII, p. 399 (1822).

Berenicornis comatus Bp. Consp. I, p. 91.

Anorrhinus comatus Everett, L. B. Born. p. 164; Sharpe, Ibis 1890, p. 16.

An adult female from Bruny River (Upper Mahakkam). — Iris ochraceous, bill and feet dirty gray.

Hab. Malay Peninsula, Sumatra and Borneo.

»Dieser Vogel lebt nur paarweise. Seine Stimme ist ein lebhaftes, sich oft hinter einander wiederholendes »kukuk'', beinahe wie der Ruf des europäischen Kukuks'' (v. Berchtold).

Meropidae.

63. *Merops philippinus*.

Merops philippinus Linn. Syst. Nat. Ed. 13, I, p. 183 (1767)¹⁾; Salvad. Ucc. Born. p. 89; Everett, L. B. Born. p. 164.

1) A supplementary edition to the twelfth, published at Vienna, 1767,

A female from Pontianak, N° 1517 (Moret) and another from a plantation at Poetoes Sibau (N° 2). — Iris red, bill black, feet gray. The first specimen differs from the typical habitus in having the feathers on head, hind neck, mantle, lesser wing-coverts and breast broadly bordered with blue, and in having the throat but faintly shaded with chestnut. The plumage in this specimen is rather worn off and the centre tail-feathers are newly moulted.

Hab. Malay Peninsula, the Philippines and the whole Malay Archipelago.

64. *Nyctiornis amicta*.

Merops amictus Temm. Pl. Col. IV, pl. 310 (1824).

Nyctiornis amicta Salvad. Ucc. Born. p. 91; Everett, L. B. Born. p. 164; Sharpe, Ibis 1890, p. 18.

Numerous specimens from Mounts Kenepai and Liang Koeboeng, and seven specimens from Long Bloe (Upper Mahakkam). — Iris orange-red, bill black, base of lower mandible white, feet green. — Contents of stomach: wild bees.

Hab. Malay Peninsula, Sumatra and Borneo.

Alcedinidae.

65. *Alcedo bengalensis*.

Alcedo bengalensis Gm. S. N. I, p. 450 (1788); Salvad. Ucc. Born. p. 92; Everett, L. B. Born. p. 158; Sharpe, Ibis 1890, p. 18.

Alcedo ispida (part.) Sharpe, Cat. B. Br. Mus. XVII, p. 141.

A small series from Pontianak, Sanggau and Smitau. — Iris black, bill in the male entirely black, in the female black, lower mandible red; feet red.

Hab. South-eastern Asia, Japan, Malay Archipelago.

66. *Alcedo meninting*.

Alcedo meninting Horsf. Trans. Linn. Soc. XIII, p. 172 (1822); Salvad. Ucc. Born. p. 93; Sharpe, Ibis 1890, p. 18.

where this specific name is based upon Brisson's *Apiaster philippinus major* (see also Walden, Trans. Zool. Soc. VIII, p. 42).

Alcedo asiatica Everett, L. B. Born. p. 159.

Six specimens from Pontianak, Poetoes Sibau and Nanga Raoen, four specimens from the Upper- and one from the Lower Mahakkam. — Iris dark brown, bill black with white tip, inside of mouth orange-red, feet minium-red.

Hab. Malay Peninsula, the Sunda Islands and Celebes.

Field-notes of Mr. von Berchtold: »Ein rascher und scheuer Vogel, der sehr gut taucht und mit grosser schnelligkeit einige Meter über dem Wasser dahinfliegt. Fast bloss im Fliegen lässt er seine »sih, sih'' klingende Stimme hören, bei welcher die Töne schnell auf einander und fast in gleicher Höhe folgen. Wenn er auf Beute lauert, sitzt er unbeweglich auf einem Zweige des überhängenden Ufergebüsches».

67. *Alcedo euryzona*.

Alcedo euryzona Temm. Pl. Col. text in livr. 86 (1830); Salvad. Ucc.

Born. p. 95; Everett, L. B. Born. p. 159; Sharpe, Ibis 1890, p. 18.

An adult female from the forests of Mount Liang Koeboeng and another from Long Bloe (Upper Mahakkam). — Iris brown, bill black, lower mandible coral-red, feet coral-red.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

68. *Pelargopsis leucocephala*.

Alcedo leucocephala Gm. S. N. I, p. 456 (1788).

Pelargopsis leucocephala Salvad. Ucc. Born. p. 95; Everett, L. B.

Born. p. 159; Sharpe, Ibis 1890, p. 19.

Three specimens from Poetoes Sibau (Coll. Nieuwenhuis). — Iris brown, bill and feet red.

Hab. Restricted to Borneo.

Annotations of Mr. von Berchtold: »Ein kluger und scheuer, zanksüchtiger Vogel, der leidlich schwimmt und niedrig über dem Wasser hinfliegt. Im Aufzuge lässt er seine starke, unangenehme Stimme hören, bei welcher die einzelnen Töne schnell hinter einander folgen. Den grössten Theil des Tages sitzt er auf einem guten Aussichtspunkte,

dem Aste eines niedrigen Uferbaumes, zieht bei drohender Gefahr den Kopf in die Höhe und fliegt pfeilschnell davon. Während er im Flussgebiete des Kapoeas häufig vorkommt, habe ich ihn im Gebiete des Mahakkam nur einmal, und zwar Mitte September 1896 am Bruny-Flusse angetroffen.

Am Koetei-Flusse, unterhalb den Fällen des Mahakkam, habe ich einige Exemplare zu Gesicht bekommen. Doch hier war ihr Betragen ein ganz anderes! Mitte Mai 1897, als ich in der Morgendämmerung in einem Boote durch die überschwemmten Uferwälder des Koetei-Flusses hinfuhr, bemerkte ich in den höchsten Baumkronen ein Männchen, einen starken, pfeifenden und klagenden Ton ausstossend. Auf diesen Lockruf flog das Weibchen herbei, schien das Männchen zu necken und flog dann wieder davon. Das Männchen verfolgte es, setzte sich auf einen andern grossen Baum und schrie von Neuem, bis sich das Weibchen abermals näherte. Bei diesem Jagen, das ich einige Tage hinter einander, aber nur am frühen Morgen bemerkt habe, entfernten sich die beiden Exemplare bis auf einige hundert Schritte in den Wald hinein. Nach diesem eigenthümlichen Benehmen schliesse ich, dass sich die Vögel in der Paarungszeit befanden".

69. *Ceyx Dillwyni*.

Ceyx Dillwyni Sharpe, P. Z. S. 1868, p. 591; Salvad. Ucc. Born. p. 99; Everett, L. B. Born. p. 160; Sharpe, Ibis 1890, p. 19.

Four specimens from Nanga Raoen, Poetoes Sibau and Poelau and five from the Upper Mahakkam (1898—99). — Iris black, bill and feet coral-red; bill of young specimens black.

Hab. Nias and Borneo.

70. *Ceyx euerythra*.

Ceyx rufidorsa (nec Strickl.) Everett, L. B. Born. p. 159.
Ceyx euerythra Sharpe, Cat. B. Br. Mus. XVII. p. 179.

Two specimens from Pontianak and Poelau. — Iris dark brown, bill and feet coral-red.

Hab. Malay Peninsula, Sumatra, Borneo and the Southern Philippines.

71. *Halcyon coromandus*.

Alcedo coromanda Lath. Ind. Orn. I, p. 252 (1790).

Callialcyon coromanda Salvad. Ucc. Born. p. 101.

Halcyon coromanda Everett, L. B. Born. p. 160; Sharpe, Ibis 1890, p. 20.

An adult male from Pontianak, and another from Long Bloe (Upper Mahakkam).

Hab. Eastern and south-eastern Asia, Formosa, Philippines, Sunda Islands, Celebes and Sanghi¹⁾.

72. *Halcyon pileatus*.

Alcedo pileatus Bodd. Tabl. Pl. Enl. p. 41 (1783).

Entomobia pileata Salvad. Ucc. Born. p. 102.

Halcyon pileata Everett, L. B. Born. p. 160; Sharpe, Ibis 1890, p. 20.

Eight specimens from Long Bloe (Upper Mahakkam). — Iris dark brown, bill and feet coral-red. — Contents of stomach: small insects.

Hab. From India eastward to China, and south-eastward through the Malay Peninsula and the Sunda Islands to Celebes.

»Am oberen Mahakkam keine seltene Erscheinung" (von Berchtold).

73. *Halcyon concretus*.

Dacelo concreta Temm. Pl. Col. 346 (1825).

Caridagrus concretus Salvad. Ucc. Born. p. 102.

Halcyon concretus Everett, L. B. Born. p. 161; Sharpe, Ibis 1890, p. 21.

An adult female from Mount Kenepai, and two from Long Bloe (Upper Mahakkam). — Iris dark brown, bill yellow, culmen black, feet yellow.

Hab. Malay Peninsula, Sumatra and Borneo.

1) The birds from Celebes and Sanghi are mentioned as subspecifically distinct (*Halcyon coromanda rufa*) by Meyer and Wieglesworth in their recent work on the birds of Celebes, p. 280.

74. *Carcineutes melanops*.

Halcyon melanops Bp. Consp. I, p. 154 (1850).

Lacedo melanops Salvad. Ucc. Born. p. 104.

Carcineutes melanops Everett, L. B. Born. p. 161; Sharpe, Ibis 1890, p. 21.

Four specimens from Mounts Kenepai and Liang Koeboeng, Poelau, and from Long Bloe (Upper Mahakkam). — Iris dark brown, bill minium-red, feet yellowish green. — Contents of stomach: small beetles.

Hab. Borneo generally, but nowhere common.

Coraciidae.75. *Eurystomus orientalis*.

Coracias orientalis Linn. Syst. Nat. I, p. 159 (1766).

Eurystomus orientalis Salvad. Ucc. Born. p. 105; Everett, L. B. Born. p. 165; Sharpe, Ibis 1890, p. 21.

Five specimens from Pontianak, Mount Liang Koeboeng and Nanga Raoen, and one from the Upper Mahakkam. — Iris brown, bill red, with black tip to the upper mandible, feet red.

Hab. Eastern part of British India, Malay Peninsula, Sumatra, Java, Borneo and the Philippines.

Eurylaemidae.76. *Calyptomena viridis*.

Calyptomena viridis Raffl. Trans. Linn. Soc. XIII, p. 295 (1822); Salvad. Ucc. Born. p. 106; Everett, L. B. Born. p. 150; Sharpe, Ibis 1889, p. 438.

Numerous specimens from Roema Manoeal and the Liang Koeboeng, also from Long Bloe, Upper Mahakkam. — Iris black, bill black, base of lower mandible yellow, feet bluish green, soles ochre. — Contents of stomach: pieces of the fruits of *Urostigma*.

Hab. From Tenasserim through the Malay Peninsula to Sumatra (with the inclusion of Nias and the Batu Islands), and Borneo.

77. *Calyptomena Hosei*.

Calyptomena Hosei Sharpe, Ann. & Mag. Nat. Hist. (6) IX, p. 249, 1892; id. Ibis 1892, p. 438, pl. X; Hose, Ibis 1893, p. 404; Sharpe, Ibis 1893, p. 549.

Numerous specimens, representing both sexes, were obtained in the dense mountain forests of the Liang Koeboeng range, a female on the eastern foot of the latter, in the valley of the river Siniai, and a young female from Nanga Raoen. — Iris dark brown, bill black, feet olive green. In the half-grown immature female the blue central streak on breast and abdomen is entirely wanting.

Hab. Borneo (Mountains of Sarawak and Liang Koeboeng, but not found on Mount Kenepai, though this latter is much nearer to Sarawak than the Liang Koeboeng).

78. *Eurylaemus javanicus*.

Eurylaemus javanicus Horsf. Trans. Linn. Soc. XIII, p. 179 (1822); Salvad. Ucc. Born. p. 107; Everett, L. B. Born. p. 150; Sharpe, Ibis 1889, p. 439.

Five specimens from Mounts Kenepai and Liang Koeboeng and one from the Upper Mahakkam. — Iris bluish white, bill blue, tip and edge black, followed by a green band, feet flesh-color.

Hab. From Tenasserim throughout the Malay Peninsula, Sumatra, Java and Borneo, where it is spread over the whole island.

79. *Eurylaemus ochromelas*.

Eurylaemus ochromelas Raffl. Trans. Linn. Soc. XIII, p. 297 (1822); Salvad. Ucc. Born. p. 108; Everett, L. B. Born. p. 150; Sharpe, Ibis 1889, p. 439.

A great number of specimens from Pontianak, Roema Manoeal, Mount Kenepai, Mount Liang Koeboeng, Nanga Raoen, Poetoes Sibau, and Poelau, also from Long Bloe (Upper Mahakkam). In the male the black cross-band on the breast is complete, while in the female it is interrupted on the centre of the breast. — Iris sulphur-yellow, bill in

life cobalt, tip pale green (after death the cobalt-color changes into green and becomes black in dried skins), edge of upper mandible black, lower mandible green, feet pale flesh-color.

Hab. From Tenasserim throughout the Malay Peninsula to Sumatra and Borneo, where it is generally distributed.

80. *Cymborhynchus macrorhynchus*.

Todus macrorhynchus Gm. Syst. Nat. p. 446 (1788).

Cymborhynchus macrorhynchus Salvad. Ucc. Born. p. 109; Büttik.

N. L. M. 1887, p. 43; Everett, L. B. Born. p. 151; Sharpe, Ibis 1889, p. 440.

A great number of adult, immature and young specimens of both sexes from Pontianak, Poetoes Sibau, Nanga Raoen, the Siniai Valley, and Poelau. — Iris green in adult birds, in younger specimens purplish gray or brown; bill in adult birds uniform cobalt-blue, in younger specimens pale green, edge blue, followed by yellow, in quite young birds pale green with blackish tip, lower mandible with blue edgings, followed by green, and yellow in the centre, in young specimens entirely rosy; feet purplish blue. Two fledged young birds have breast and abdomen barred with rosy-red and grayish brown, but in the male the throat is blackish, while in the female this part is yellowish white, which color is separated from the barred breast by a dusky blackish broad bar across the chest. The red color on the rump and the white shoulder-coverts are plainly developed, but the black color of the upper surface yields to a brownish tinge and is destitute of any gloss. The white on the inner edge of the outer tail-feathers varies very much in extent and in some specimens is even entirely wanting. This difference seems to me quite individual, and not due to locality, age or sex of the bird (see also my explanations in N. L. M. 1887, p. 43).

Hab. Malay Peninsula, Sumatra, Banka and Borneo, where it is spread over the whole island, keeping by preference to the banks of the rivers.

The collecting list of Mr. von Berchtold contains the

following field-notes about the habits, the nest and the eggs of this bird:

»Diese ruhigen und wenig scheuen Vögel leben stets paarweise zusammen. Wenn getrennt locken sie sich so lange, bis sie sich wieder zusammengefunden haben. Durch ihre unangenehme, krächzende Stimme »queck, queck, queck“ wird man leicht auf ihr Vorhandensein aufmerksam gemacht. Sie fliegen wellenförmig und nie hoch über dem Flusspiegel von einem Baume zum andern. Das Vogelpaar baut sein ziemlich grosses Nest hängend und in Kugelform, doch sehr unordentlich an herabhängenden Lianen oder an alleinstehenden Bäumchen an den Ufern der Flüsse. Der Eingang zum Neste ist mit einem Schutzdach versehen. Mitte März fand ich am Landack-Flusse ein Nest mit drei leichtschmutzig gelben, etwas röthlich angehauchten und mit unregelmässigen, sepiabraunen Flecken versehenen Eiern. Desgleichen am Boengan-Flusse ¹⁾ ein Nest mit zwei Eiern (16 Juli 1896)“.

81. *Corydon sumatranus*.

Coracijs sumatranus Raffl. Trans. Linn. Soc. XIII, p. 303 (1822).

Corydon sumatranus Salvad. Ucc. Born. p. 111; Everett, L. B. Born. p. 151; Sharpe, Ibis 1889, p. 440.

Three specimens from Mount Liang Koeboeng and Poelau (Sibau River). — Iris coffee-brown, bill and naked space round the eye flesh-color, feet brown.

Hab. From Tenasserim through the Malay Peninsula to Sumatra and Borneo, where it is found throughout the island.

Caprimulgidae.

82. *Batrachostomus javensis*.

Podargus javensis Horsf. Trans. Linn. Soc. XIII, p. 141 (1822).

Podargus cornutus Temm. Pl. Col. 159 (1823).

1) Tributary of the Upper Kapoeas.

Batrachostomus javensis Salvad. Ucc. Born. p. 112; Hartert, Cat. B. Br. Mus. XVI, p. 640.

Batrachostomus cornutus Tweedd. P. Z. S. 1877, p. 432, pl. 46; Everett, L. B. Born. p. 165.

A single specimen (red phase), collected on Mount Baloe, at the head of the Sekajam River, at a height of 800 meter by Mr. Westenenk (in spirits). — Iris yellow, bill yellowish horn-color, feet pale flesh-color.

Hab. Sumatra, Banka, Borneo, where it seems to be generally distributed, and Java.

83. *Batrachostomus stellatus*.

Podargus stellatus Gould, P. Z. S. 1837, p. 43.

Batrachostomus stellatus Gray, Gen. B. I, p. 45; Salvad. Ucc. Born. p. 113; Everett, L. B. Born. p. 165.

Podargus parvulus Schleg. J. f. O. 1856, p. 460; id. Handl. Dierk. pp. 224, 481, Atlas pl. II, fig. 15.

A single specimen (N^o 199) collected in low jungle at the foot of Mount Kenepai. — Iris orange yellow, bill horny yellow, feet yellowish flesh-color.

Hab. Malay Peninsula, Sumatra, Banka and Borneo, where it seems to be distributed over the whole island.

84. *Batrachostomus auritus*.

Batrachostomus auritus (Gray) Sharpe, P. Z. S. 1875, p. 99; Everett, L. B. Born. p. 165; Hart. Cat. B. Br. M. XVI, p. 637.

An adult male, and a nestling (Dr. Nieuwenhuis, 5 January 1899).

The adult bird agrees perfectly with specimens from Sumatra. Wing 275 mm. — Iris light brown in adult and young.

Hab. Malay Peninsula, Sumatra and Borneo.

85. *Batrachostomus Harterti*.

Batrachostomus Harterti Sharpe, Ibis 1892, p. 323; Hartert, Cat. Birds Br. Mus. XVI, p. 638, pl. XIV.

An adult female from Mount Liang Koeboeng (890

meter). — Iris nut-brown, bill brown, yellowish green at the base, feet flesh-color. Wing 22 cm. (8,8 inches), tail 16,3 cm. (6,4 inches).

This bird agrees with description and plate of *B. Harterti* as to the pattern, but is very strongly tinged with ashy and in this way it differs strongly from the typical specimen as described and figured in the above mentioned catalogue.

Hab. Borneo: Mount Dulit and Liang Koeboeng.

86. *Lyncornis Temminckii*.

Lyncornis Temminckii Gould, Icon. Av. pt. 2 (1838); Bp. Consp. I, p. 62; Salvad. Ucc. Born. p. 115; Everett, L. B. Born. p. 153.

One specimen (♀) from Roema Manoeal, and another from Long Bloe, Upper Mahakkam. — Iris black, bill and feet brown.

Hab. Malay Peninsula, Sumatra and Borneo.

87. *Caprimulgus macrurus*.

Caprimulgus macrurus Horsf. Trans. Linn. Soc. XIII, p. 142 (1822); Salvad. Ucc. Born. p. 117; Everett, L. B. Born. p. 153; Sharpe, Ibis 1890, p. 22.

Three males from Pontianak. — Iris dark brown, bill and feet black.

Hab. From the Malay Peninsula through the Malay Archipelago and New Guinea to Australia.

88. *Caprimulgus jotaka*.

Caprimulgus jotaka Temm. & Schleg. Faun. Jap. Aves, p. 37, pl. 12 (1847); Hartert, Cat. B. Br. Mus. XVI, p. 522.

A female from Smitau. — Iris and bill black, feet brown.

Hab. Eastern Asia, from Mantchuria through China and Japan to Burmah; migrating in winter to Malacca and the Sunda Islands.

Cypselidae.

89. *Micropus subfurcatus*.

Cypselus subfurcatus Blyth, Journ. As. Soc. Beng. XVIII, p. 807 (1849); Salvad. Ucc. Born. p. 118.

Micropus subfurcatus Hartert, Cat. B. Br. Mus. XVI, p. 456.

A male specimen from Pontianak. — Iris dark brown, bill black, feet black, tinged with lilac.

Hab. From Cochin China through Malacca to Sumatra and Borneo.

90. *Collocalia fuciphaga*.

Hirundo fuciphaga Thunbg. Act. Holm. XXXIII, p. 151, pl. 4 (1772).

Collocalia fuciphaga Salvad. Ucc. Born. p. 120; Everett, L. B. Born., p. 152; Sharpe, Ibis 1889, p. 23.

A specimen from Pontianak in spirits and a skin from Nanga Raoen, and two specimens from the Upper Mahakkam. — Iris dark brown, bill black, feet purplish flesh-color.

Hab. From the Continent through Malacca and the Sunda Islands; rather common throughout Borneo.

91. *Collocalia Linchi*.

Collocalia Linchi Horsf. & Moore, Cat. B. Mus. E. I. Comp. I, p. 100 (1854); Salvad. Ucc. Born. p. 121; Everett, L. B. Born. p. 152; Sharpe, Ibis 1890, p. 23.

Two specimens (N^o 728 in spirits and N^o 874 skin) from Mount Liang Koeboeng and an adult male from the Upper Mahakkam. — Iris and bill black, feet brown. N^o 874 was caught in a cave of the large grotto which formed my abode on Mount Liang Koeboeng. The nest was stuck to the ceiling of the cave and exists of a filthy mass of black rootlets. The nest is quite flat and without a cup. The eggs could not be obtained.

Hab. All over the Sunda Islands, including the Andamans and Nicobars.

92. *Macropteryx longipennis*.

Hirundo longipennis Rafin. Bull. Soc. Phil. III, p. 153 (1804).

Dendrochelidon longipennis Salvad. Ucc. Born. p. 122; Sharpe, Ibis 1890, p. 24.

Macropteryx longipennis Everett, L. B. Born. p. 152.

A number of specimens from Smitau, one from Pontianak

and one from the Upper Mahakkam. — Iris and bill black, feet gray.

H a b. From Tenasserim through the Malay Peninsula and the Sunda Islands.

93. *Macropteryx comata*.

Cypselus comatus Temm. Pl. Col. 268 (1824).

Dendrochelidon comata Salvad. Ucc. Born. p. 123; Sharpe, Ibis 1890, p. 23.

Macropteryx comatus Everett, L. B. Born. p. 152.

One specimen from Sanggau, two from the foot of Mount Kenepai, one from the Upper Sibau River and six from Long Bloe (Upper Mahakkam). — Iris dark brown, bill black, feet brown.

H a b. Malay Peninsula, the Sunda Islands, Timor, Celebes and the Philippines.

94. *Chaetura gigantea*.

Cypselus giganteus Temm. Pl. Col. 364 (1825).

Chaetura gigantea ScL. P. Z. S. 1865, p. 608; Everett, L. B. Born. p. 151; Hartert Cat. B. Br. M. XVI, p. 475.

Hirundinapus giganteus Salvad. Ucc. Born. p. 124.

An adult male (Dr. Nieuwenhuis, 9 January 1899).

This specimen has the whole under surface considerably darker than the type-specimen figured by Temminck and said to be from Java (Bantam, sent by van Hasselt), but a specimen from Sumatra (Coll. Dr. Klaesi) is intermediate, showing the underparts not as light as the Javan specimen, but lighter than that from Borneo, which is almost black instead of smoky black.

H a b. Malay Peninsula, Sumatra, Java and Borneo.

Hirundinidae.

95. *Hirundo rustica*.

Hirundo rustica L. Syst. Nat. I, p. 343 (1766); Sharpe, Cat. B. Br. M. X, p. 128.

Hirundo gutturalis (Scop.) Salvad. Ucc. Born. p. 125; Everett, L. B. Born. p. 134.

Two females in moult from the Upper Mahakkam (Dr. Nieuwenhuis, 29 December 1898 and 6 January 1899).

96. *Hirundo javanica*.

Hirundo javanica Sparrm. Mus. Carlsr. t. 100 (1789); Temm. Pl. Col. 83, fig. 2; Salvad. Ucc. Born. p. 126; Everett, L. B. Born. p. 134; Sharpe, Ibis 1889, p. 430.

Two not fully adult females with but very slight traces of red on the fore-head, collected at Nanga Raoen (May 21st 1894), and ten specimens from the Upper Mahakkam. — Iris dark brown, bill black, angle of mouth yellow, feet lead-color.

Hab. Southern India and Ceylon, Malay Peninsula, through the Malay Archipelago and Southern Philippines to the Moluccas and New Guinea.

Muscicapidae.

97. *Hemichelidon sibirica*.

Muscicapa sibirica Gm. S. N. I, p. 936 (1788).

Hemichelidon sibirica Everett, L. B. Born. p. 126; Sharpe, Ibis 1894, p. 543 (Mount Mulu).

A female (N^o. 698) from the western slope of Mount Liang Koeboeng, March 22^d 1894. — Iris dark brown, bill black, lower mandible whitish at the base, mouth intensely yellow, feet sooty brown.

This specimen agrees in every respect with a specimen in the Leyden Museum, collected by S. Müller in the highlands of Western Sumatra. Both these specimens have the bill obviously larger than our three specimens from the Continent, but this difference I do not consider as sufficient to base a new species upon.

Hab. Eastern Siberia, Himalaya Mountains, Burma, Sumatra, Palawan and Borneo. On the latter Island it has been collected on Mount Mulu by Mr. Hose's hunters.

98. *Alseonax latirostris*.

Muscicapa latirostris Raffl. Trans. Linn. Soc. XIII, p. 312 (1822).
Alseonax latirostris Salvad. Ucc. Born. p. 129; Sharpe, Ibis 1889,
 p. 195; id. id. 1890, p. 275.

Three females, obtained at Smitau (December 6th and 11th) and Mount Kenepai (January 31st), and three specimens from the Upper Mahakkam. — Iris black, bill black, lower mandible whitish at the base, mouth yellow, feet black.

Hab. Eastern Siberia, Japan, China, a winter visitor in India, Ceylon, Burma, Malay Peninsula, Penang, Sumatra, Java, Borneo and the Philippines.

99. *Erythromyias Mülleri*.

Muscicapa Mülleri Blyth, Ibis 1870, p. 166; Salvad. Ucc. Born. p. 129.
Erythromyias Mülleri Sharpe, Cat. B. Br. Mus. IV, p. 200; Hose,
 Ibis 1893, p. 396; Sharpe, Ibis 1893, p. 551; id. id. 1894, p. 421.

A great number of specimens from the Liang Koeboeng range, about 800 meters above the level of the sea. This bird is frequenting the undergrowth of the high forest and has a nice sweet note. — Iris black, bill black, feet pale flesh-color or dirty white.

The adult female, having not been described as yet, resembles the adult male in the color of the lower surface, but the upper surface is olive-brown instead of black, the longitudinal white band on the wing much less distinct, and the white superciliar stripe wanting. The tail is black with white bases to all but the innermost tail-feathers, like in the male. Immature birds are reddish brown above and have the greater and median wing coverts broadly tipped with rufous.

Hab. Sumatra and Borneo: Banjermassin (Schwaner), West-Borneo (Crookewit), mountains of Sarawak (Hose, Everett).

100. *Xanthopygia cyanomelana*.

Muscicapa cyanomelana Temm. Pl. Col. III, pl. 470; Temm. & Schl.
 Faun. Jap. p. 47 (1829).

Muscicapa melanoleuca Temm. & Schl. Faun. Jap. Aves, pl. 17 D.

Muscicapa gularis Temm. & Schl. Faun. Jap. Aves, pl. 16 (·).

Xanthopygia cyanomelaena Everett, L. B. Born. p. 128; Sharpe, Ibis 1889, p. 196.

Niltava cyanomelaena Seeböhm, Birds Jap. Emp. p. 59.

Six males and three females were collected on Mount Kenepai, from 17—30 January 1894. Most of the males are in transitional stage, and none of them have assumed the full breeding plumage. The females are characterized by a white spot on the centre of the throat. — Iris dark brown, bill black with the base of lower mandible whitish in the female, feet gray.

Hab. Manchuria, North China and Japan, only a winter visitor in Borneo.

101. *Siphia Everetti*.

Plate 14 (ad. ♂, ad. ♀, immature ♂ and young ♂).

Siphia Everetti Sharpe, Ibis 1890, p. 366; Hose, Ibis 1893, p. 399.

Thirteen specimens of both sexes, from the fledged young to the fully adult bird, obtained on Mount Kenepai, at an altitude of 600 meter, and in the thick primeval forest on the western slope of Mount Liang Koeboeng (800 meter).

As there is not yet published a full description of this species, and Dr. Sharpe having compared it, in his short diagnosis, with *S. cyanea* (Hume)¹⁾ from Teuasserim, which is very rare in collections, I venture to give here a more detailed description.

Adult male. Upper surface deep indigo-blue, more lively on crown and upper wing-coverts, a broad frontal band extending above the eye cobalt-blue, lores and a narrow base of the frontal band black, wing black, all the quills, with the exception of the two outermost primaries, edged with the color of the back; central tail-feathers like the back, the outer pairs black on the inner and blue only on

¹⁾ *S. cyanea* (Hume, 1877) has turned out to be *S. concreta* (Müller, 1835), see N. L. M. Vol. XVIII, p. 221.

the outer web; sides of head and neck, chin, throat, chest and sides of breast blue like the upper surface, centre of breast and flanks more purplish gray, intermixed with white; abdomen, vent and under tail-coverts pure white, as well as a long tuft of fluffy feathers on the sides of the rump; tail and wing underneath black, the quills faintly edged on their inner webs with smoky brown, under wing-coverts dark gray, the outer parts slightly tinged with blue, edge of wing entirely blue. Iris dark brown, bill black, feet bluish gray, soles orange-yellow. Wing 8—8,4 cm., tail 5,5, tarsus 2, culmen 1,8.

Adult female. Upper surface and anterior part of lower surface russet brown, strongly tinged with ferruginous on forehead, superciliary region, lores, sides of head, chin and throat; wing-coverts like the back, quills dark brown, the inner primaries and still more so the secondaries broadly edged with chestnut-brown, upper tail-coverts likewise chestnut-brown, tail dark brown, the central pair above rufous brown, the lateral pairs edged with rufous brown on the outer web and with white on the inner, the white margin being very narrow if not entirely absent on the outermost pair and rather broad on the three following pairs, but not reaching entirely to the tip. Moreover the third, fourth and fifth pair are margined with leaden blue on the basal two thirds of the outer web, while on the fourth pair this blue color borders a white longitudinal spot. Centre of throat pure white, partly concealed by the tips of the posterior feathers being tipped with rufous brown; breast, flanks and thighs olive-brown; centre of breast, abdomen, vent and under tail-coverts white, more or less spotted and streaked with the color of breast and flanks; under wing-coverts white, varied with fulvous, inner web of the quills margined with ashy white. Color of iris, bill and feet as in the male. The female is very much like male and female of *Rhinomyias gularis* Sharpe in its general coloration and the white gular patch, but is easily distinguished from the latter by

the white pattern on the tail-feathers and the absence of the isabellina superciliary stripe. Wing 8 cm., tail 5,3—5,5; tarsus 2, culmen 1,8.

Two fledged young birds (♂ and ♀), killed April 2^d and 5th, probably just after having left their nest, are dark brown, back and wing-coverts with a large rusty brown subterminal spot on each feather; the quills broadly margined with the same rusty brown, which color predominates also on the whole head, where it forms broad shaft-streaks, as well as on fore-neck and chest. The centre of throat is already showing the white half-concealed spot of the adult female, the abdomen and under tail-coverts are white, but strongly suffused with dark brown. In both, male ¹⁾ and female, the white pattern on the tail-feathers is indicated, though they hardly exceed a centimetre in length.

The adult stage in male and female seems to be attained by a slow change of color rather than by a moult, beginning at the base and slowly proceeding towards the tip of the feather.

The plumage of the adult is first acquired on back, upper wing-coverts and breast, and the last remnants of the rufous spots are found, as is shown by some specimens before me, at the base of the bill and on the superciliary region.

This species belongs to the larger forms of the genus, and especially the bill is rather clumsy. Like its nearest ally, *S. concreta* from Tenasserim, it is only found in mountain-forests.

Hab. Borneo: Mount Penrisen (Everett), Mount Dulit (Hose), Mounts Kenepai and Liang Koeboeng.

102. *Siphia unicolor*.

Cyornis unicolor Blyth, J. A. S. B. XII, pp. 941 and 1007 (1843); Oates, Faun. Br. Ind. Birds II, p. 22.

1) The young bird noted as a male might after all be a female, on account of the white pattern on the tail-feathers, which is entirely absent in the adult male.

Cyornis cyanopolia Blyth, Ibis 1870, p. 165 (ex Boie M. S. in Mus. Lugd.); Salvad. Ucc. Born. p. 132.

Siphia unicolor Sharpe, Cat. B. Br. Mus. IV, p. 444; Sharpe, Ibis 1894, p. 542.

An adult male (N^o 983) from the western slope of Mount Liang Koembang. — Iris dark brown, bill black, feet purplish. This bird was shot in low bamboo-jungle at an altitude of 850 meter above the sea-level.

Oates (l. c.) seems to doubt somewhat the identity of the Malay *S. cyanopolia* with *S. unicolor* from the Continent, saying that it is a much brighter bird than *S. unicolor*, but having no specimen from the Continent to compare with our specimens from Java and Borneo, and Sharpe (Ibis 1894, p. 542) identifying a specimen from Mount Mulu with *S. unicolor*, I prefer to follow this latter authority.

Hab. Eastern Himalayas to the Malay Peninsula, Java and Borneo.

103. *Siphia elegans*.

Muscicapa elegans Temm. Pl. Col. III, pl. 596, fig. 2 (♂) ¹⁾

Cyornis elegans Walden, Ibis 1872, p. 373; Salvad. Ucc. Born. p. 130; Blasius, Verein. Naturw. Braunsch. 1881, p. 34.

Siphia elegans Sharpe, Cat. B. Br. Mus. IV, p. 447; Everett, L. B. Born. p. 132; Sharpe, Ibis 1889, p. 205.

Cyornis turcosa Brügg. Abh. Nat. Ver. Brem. V, p. 457.

Siphia turcosa Sharpe, Cat. B. Br. Mus. IV, p. 453; id. Ibis 1893, p. 551; id. id. 1894, p. 421.

An adult female from Smitau, four males and two females from Nanga Raoen and four specimens from the Sibau River; also from the Upper Mahakkam. Found in bamboo-jungle and brushwood of abandoned native plantations. — Iris dark brown, bill black, feet purplish gray.

1) Dr. Sharpe, Cat. B. IV, p. 447, mentions *Muscicapa cantatrix* ♀ Temm. Pl. Col. III, pl. 226, fig. 2, as belonging to the synonymy of *S. elegans*. This is undoubtedly an error, the bird in question, which still makes part of the Leyden collections, being a female in transitional stage of plumage of *S. banyumas* (Horsf.) = *Muscicapa cantatrix* Temm. The pure white lores combined with the red color of the entire lower surface leave no doubt as to its identity with the female of *S. banyumas*.

This species is exclusively an inhabitant of the lower country. In the Kapoeas-region we never met with it at any considerable elevation above the plain or the bottom of the valleys, nor is any instance known in literature of its occurrence on the hitherto explored mountains of Borneo, except a female stated by Dr. Sharpe (Ibis 1889, p. 205) to be found by Mr. Whitehead »on Kina Balu at 3000 feet''.

I have, however, very strong reasons to doubt the identity of the mentioned female from Kina Balu with *S. elegans*. Nay, from the synonymy of *S. elegans* in the Catalogue of Birds we learn that Dr. Sharpe considers the female of this species to have a white loreal spot, as the learned author adds to this synonymy *Muscicapa cantatrix* Temm. Pl. Col. III, pl. 226, fig. 2 (♀) and *Cyornis banyumas* Tweedd., P. Z. S. 1878, p. 615 (♀), both having white lores. The first is, however, as is proved by the original specimen still preserved in our Museum, nothing but an immature female of *S. banyumas*, and the second has afterwards been identified by Mr. Everett (Ibis 1895, p. 25) as the female of *S. Lemprieri* Sharpe. The female in question, from Kina Balu, 3000 feet, very probably belongs to *S. coeruleata* (Bp.), which is, at least for the basin of the Kapoeas, unquestionably a mountain form, of which I collected females in different stages of plumage, all with more or less distinct rufous or whitish lores.

The real females of *S. elegans* (two of them were killed together with their males) have no loreal spot at all and can only be distinguished from the males by the want of the blue color on chin and throat, which parts are of a somewhat paler rufous than the chest. They can by no means be distinguished from *S. turcosa*, which is, in fact, nothing but the female of our *S. elegans*, a conclusion which gets still more strength by the fact that *S. turcosa* is likewise an inhabitant of lower countries and was never found above an elevation of 1000 feet.

Hab. Malacca, Sumatra and Borneo, where it is very widely distributed ¹).

104. *Siphia coeruleata*.

Schwaneria coeruleata Bp. Rev. et Mag. de Zool. 1857, p. 54 (e-Temm. M. S.); Salvad. Ucc. Born. p. 134.

Cyornis rufifrons Wallace, P. Z. S. 1865, p. 476; Salvad. Ucc. Born. p. 131; Sharpe, Ibis 1878, p. 416 (partim).

Siphia coeruleata Sharpe, Cat. B. Br. Mus. IV, p. 451; Everett, L. B. Born. p. 133.

(?) *Siphia elegans* (part.) Sharpe, Ibis 1889, p. 205 ²).

Six adult males and a nestling of the same sex, and five females in more or less fully developed dress, all obtained in the mountain-forests of the Liang Koeboeng-range, not below 800 meter. — Iris dark brown, bill black, feet in fresh specimens purplish, in dry state pale brown, but by far not so whitish as in our typical specimen.

This species is allied to *S. banyumas*, having the lower surface entirely orange rufous, the centre of the abdomen only being white in some specimens, but it differs from the latter in having the black chin-spot very small and the moustaches dark blue instead of blackish. Much more important than between the males the difference is between the adult females. In *S. banyumas* the adult female much resembles the male in color, but is provided with a conspicuous white loreal spot and instead of the large black chin-spot and ditto beard-stripes these parts are rufous like the rest of the under surface. The adult female of *S. coeruleata* agrees with that of *S. banyumas* as to the want of a dark chin-spot, but the upper surface is not entirely blue like in the male, but olive-brown, with a darker, more grayish

1) Dr. Sharpe includes Java in the geographical distribution of this species, probably on account of a female in the collection of the British Museum, but for the above developed reasons I guess that the specimen in question is an immature female of *S. banyumas*.

2) The female of *S. elegans* mentioned at the quoted place will very likely prove to belong to the present species (see my remarks on this subject antea under the head of *S. elegans*).

tinge on the crown, and the blue color is reduced to the upper tail-coverts and the outer webs of the tail-feathers; moreover the lores (and in some specimens also a ring round the eyes) are rufous instead of pure white. In younger females the blue color on upper tail-coverts and tail are entirely wanting. The young male does not pass through the color of the female as is clearly shown by our above mentioned nestling, which, though spotted with rufous all over the upper surface, has the very short quills and upper wing-coverts already edged with the blue color of the adult bird. The entire lower surface of this nestling is orange rufous with a narrow black margin to some of the feathers, but no trace of a black chin-spot can be seen. The feet in the dried skin of this nestling are whitish yellow, like in the type of the species in our Museum, which is, by the way, not a fully adult bird, as it has some rusty red spots to the tips of the greater wing-coverts.

I may not neglect here to say that my series of males from the Liang Koeboeng does not absolutely agree with the type, this latter showing a slightly more purplish tinge on the upper surface, and a more distinct cobalt color on the rump, while the numerous black feathers on the chin indicate a larger black chin-spot than in any of my specimens from the Liang Koeboeng-range. The type being, however, not fully adult (having a few rusty tips to the wing-coverts) and in worn plumage, I dare not keep them separate on account of the above mentioned differences. Unfortunately I cannot dispose of any specimen of the so-called *S. rufifrons* from other localities of Borneo and therefore I am unable to tell whether this latter form agrees more with the typical specimen of our *S. coeruleata* or with my specimens from Liang Koeboeng.

H a b. Borneo: Sarawak, and Central and Southern Borneo (Schwaner).

105. *Siphia beccariana*.

Plate 15 (ad. ♂, ad. ♀ and immature ♂).

Cyornis beccariana Salvad. Atti R. Acad. Torino, III, p. 533 (1868);
id. Ucc. Born. p. 131.

Siphia beccariana Sharpe, Cat. B. Br. Mus. IV, p. 452; Everett, L. B.
Born. p. 133; Sharpe, Ibis 1892, p. 435; Hose, Ibis 1893, pp. 546, 551.

An adult female and an immature male from Mount Kenepai, an adult male from the Upper Sibau River, and a female from the Upper Mahakkam. A species, found in the forest of the lower mountain-regions. — Iris dark brown, bill black, feet purplish in the adult male, pale blue in the adult female, gray in the young male. This latter has the color of the adult female, suffused with rusty red, especially on the face, and with some smalt-blue feathers making their appearance on the rump, leaving no doubt as to the systematic position of the specimen.

Hab. Borneo: Hill regions of Sarawak and basin of the Upper Kapoeas.

106. *Stoparola thalassinoides*.

Hypothymis thalassina Bp. (nec Swains.) Cousp. I, p. 320.

Stoparola thalassinoides Cab. Mus. Hein. I, p. 53 (note) (1850); Salvad.
Ucc. Born. p. 132; Sharpe, Ibis 1889, p. 205; Everett, L. B. Born.
p. 132.

An adult male from the Liang Koeboeng-range. — Iris, bill and feet black.

Hab. Malay Peninsula, Sumatra and Borneo.

107. *Hypothymis azurea*.

Muscicapa azurea Bodd. Tabl. Pl. Enl. p. 41.

Hypothymis azurea Salvad. Ucc. Born. p. 133.

Hypothymis occipitalis Sharpe, Cat. B. Br. Mus. IV, p. 274; id. Ibis
1889, p. 197; Everett, L. B. Born. p. 128.

A great number of specimens from Pontianak, Sanggau, Roema Manoeal, Mount Kenepai, Liang Koeboeng (western slope and top-plateau) and Poelau; also from the Upper and Lower Mahakkam. — Iris black, eyelid blue, bill in

life ultramarine, tip black, feet dark blue. Found in low jungle as well as in high forest.

Hab. India, Malacca, the whole Malay Archipelago and the Philippines.

108. *Culicicapa ceylonensis*.

Platyrrhynchus ceylonensis Swains. Zool. Illustr. Ser. I, pl. 13.

Culicicapa ceylonensis Salvad. Ucc. Born. p. 134; Sharpe, Ibis 1889, p. 202; Everett, L. B. Born. p. 131.

Eight specimens from Mount Kenepai and the western slope of the Liang Koeboeng, where it is quite a forest-bird. Male and female are alike in color, but the male is a trifle larger than the female, the wing of this latter measuring 5,8 cm. — Iris dark brown, bill black, lower mandible whitish, feet ochraceous.

Hab. From India and Ceylon through the Malay Peninsula to Sumatra, Nias and Batu Islands, Java and Borneo.

109. *Rhipidura javanica*.

Muscicapa javanica Sparrm. Mus. Carls. III, pl. 75 (1789).

Leucocerca javanica Salvad. Ucc. Born. p. 135.

Rhipidura javanica Sharpe, Ibis 1889, p. 199; Everett, L. B. Born. p. 129; Büttik. N. L. M. 1893, p. 97.

Ten specimens from Smitau, Roema Manoeal, Nanga Raoen, Poetoes Sibau, Poelau and the Upper Mahakkam, but neither on Mount Kenepai nor Liang Koeboeng, where it is represented by *R. perlata*. Found in old rice-plantation and brushwood, very often in the immediate vicinity of native houses. — Iris black, bill and feet grayish black.

Hab. South-eastern corner of the Continent, including southern China, Malay Peninsula, Sumatra, Java and Borneo, where it seems to be restricted to the plains.

110. *Rhipidura perlata*.

Rhipidura perlata S. Müll. Verb. Land- en Volkenk. p. 185 (1839—44);

Everett, L. B. Born. p. 129; Sharpe, Ibis 1889, p. 199; Büttik. N. L. M. 1893, p. 91.

A great number of specimens from the forests of Mount Kenepai and the western slope of the Liang Koeboeng-range, never found in the low country. — Iris dark brown, bill black, feet purplish gray. The female is only distinguished from the male by its smaller size.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

111. *Terpsiphone affinis*.

Tchitrea affinis Blyth, J. A. S. Beng. XV, p. 292.

Terpsiphone affinis Salvad. Ucc. Born. p. 137; Sharpe, Ibis 1889, p. 200; Everett, L. B. Born. p. 130.

Six specimens from Mount Liang Koeboeng (780 meters) and Nanga Raoen, also observed at Roema Manoeal, and on the Upper- and Lower Mahakkam. In the mountain-forests on the western slope of the Liang Koeboeng it was undoubtedly breeding, though I was not able to find its nest. — Iris dark brown, bill and eyelid blue, tip of bill black, inside of mouth yellowish green, tongue dark green, feet pale blue.

Hab. Sout-eastern Asia, from the Himalayas throughout the Sunda Islands as far as Java.

»Von diesem Vogel wurde das Nest gefunden, leider mit zerbrochenen Eiern. Das Nest war auf einem jungen, niedrigen Bäumchen gebaut, etwas über Mannshöhe. Es hatte die Grösse eines Finkennestes, war aus Moos gebaut und mit Fäden gefüttert" (von Berchtold).

112. *Philentoma pyrrhopterum*.

Muscicapa pyrrhoptera Temm. Pl. Col. 596, fig. 2 (♂) (1836).

Philentoma pyrrhopterum Salvad. Ucc. Born. p. 138; Sharpe, Ibis 1889, p. 200; Everett, L. B. Born. p. 130.

A great number of specimens of both sexes from Roema Manoeal, Mount Kenepai, Nanga Raoen, the Siniai Valley and the mountain-forests of the Liang Koeboeng; also from the Upper- and Lower Mahakkam. — Iris red, bill black, in younger specimens flesh-color, feet grayish blue.

It is a somewhat strange fact that amongst numerous

males collected in the above mentioned localities there is not a single one in fully mature dress, all having wings and tail chestnut and breast and abdomen white with a tinge of fulvous. There are, however, specimens amongst them with some blue feathers in the wings and on the lower back and abdomen, and I should say, from this fact, that the fully blue dress of the adult male is only assumed in the dry season, which, in the Kapoeas basin, begins about May. On the other hand I am obliged to state that a specimen obtained on January 29th has just as much blue in the wing as others which were shot in April, and a male obtained on May 10th has no blue on the wings at all. It is rather incomprehensible that amongst the many males their would only immature specimens be obtained. Strange enough Mr. Oates (Faun. Brit. Ind. Birds, II, p. 43) does not mention the entirely blue dress of the adult male at all.

Hab. Malay Peninsula, Sumatra and Borneo.

113. *Philentoma velatum*.

Drymophila velata Temm. Pl. Col. 334 (♂) (1825).

Philentoma velatum Salvad. Ucc. Born. p. 139; Everett, L. B. Born. p. 130.

Twelve specimens from the forests of Mount Kenepai, Nanga Raoen and the western slope of the Liang Koeboeng, also two specimens from the Upper Mahakkam. A young female (N^o. 1123), shot together with an adult male on April 25th, in the forest of the Liang Koeboeng, probably not many days after having left the nest, is quite different from the adult birds in color. The whole plumage, with the exception of wings and tail, is chestnut-brown, yielding to maroon on the upper surface, especially on the head, but much lighter than the throat in the adult male. Wings and tail, which have not yet attained their full size, are of the same color as in the adult birds, but the scapularies and all the upper wing-coverts are brown like the back. The change of color seems to be

undergone by a complete moult, as amongst the wing-coverts and scapulary feathers there are numerous young feathers making their appearance which are entirely blue (see also Oates, Fauna Brit. Ind. Birds, II, p. 43). — Iris blood-red, in the young specimen dark brown, bill black, feet dark gray. The breeding season seems, according to the above mentioned young bird, to be in March and April.

Hab. From Tenasserim through the Malay Peninsula to Sumatra and Borneo, on which latter island it is widely distributed and an inhabitant of lower as well as mountainous countries. The Leyden Museum is in possession of specimens from Java and Timor. On the Natuna Islands this species seems to be represented by a somewhat different form, *Philentoma dubium* Hartert.

Artamidae.

114. *Artamus leucorhynchus*.

Lanius leucorhynchus L. Mant. Plant. p. 524 (1771).

Artamus leucorhynchus Salvad. Ucc. Born. p. 140; Everett, L. B. Born. p. 144; Sharpe, Ibis 1889, p. 433.

Three adult birds from Pontianak, two nestlings from Poelau, and a specimen from the Upper Mahakkam. The latter have the quills and tail-feathers slightly tipped with white, otherwise they do not differ in color from the adult. — Iris dark brown, bill bluish gray, tip black, feet dark gray.

Hab. From the Andamans through the Malaiasian region, the Moluccas and New Guinea to Australia.

Campephagidae.

115. *Pericrocotus xanthogaster*.

Lanius xanthogaster Raffl. Trans. Linn. Soc. XIII, p. 309 (1822).

Pericrocotus ardens Salvad. Ucc. Born. p. 143, pl. II.

Pericrocotus xanthogaster Sharpe, Ibis 1889, p. 192; Everett, L. B. Born. p. 125.

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An adult male from Pontianak, collected by Mr. Moret. — Iris dark brown, bill and feet black.

H a b. Malay Peninsula, Sumatra and Borneo throughout.

116. *Lalage terat*.

Turdus terat Bodd. Tabl. Pl. Enl. pl. 17 (1783).

Lalage terat Salvad. Ucc. Born. p. 145; Sharpe, Ibis 1889, p. 194; Everett, L. B. Born. p. 126.

An adult male from Pontianak, collected by Mr. Moret. — Iris brown, bill and feet black.

H a b. Malay Peninsula, Nicobars, Nias, Sumatra, Java, Banka, the Philippines, throughout Borneo.

117. *Lalage culminata*.

Ceblepyris culminata Hay, Madr. Journ. XIII, p. 157 (1844).

Volvocivora Schierbrandi Salvad. Ucc. Born. p. 148.

Lalage culminata Sharpe, Ibis 1889, p. 194; Everett, L. B. Born. p. 126.

Two males and two females from Smitau, Roema Manoeal, Liang Koeboeng, and a male and a female from the Upper Mahakkam. — Iris dark brown in the females, blood-red in the males, bill grayish black.

H a b. Malay Peninsula, Sumatra and Borneo (throughout the island).

118. *Artamides sumatrensis*.

Ceblepyris sumatrensis S. Müll. Verh. p. 190.

Graucalus sumatrensis Salvad. Ucc. Born. p. 150.

Artamides sumatrensis Sharpe, Ibis 1889, p. 191; Everett, L. B. Born. p. 125.

Two adult males, collected by Mr. Moret near Pontianak. — Iris milky white, bill and feet black, soles yellow.

H a b. Malay Peninsula, Sumatra, Borneo, where it is spread over the whole island.

119. *Irena criniger*.

Irena cyanea Salvad. Ucc. Born. p. 151 (1874); id. Ann. Mus. Civ. Genova, 1879, p. 207.

Notes from the Leyden Museum, Vol. XXI.

Irena crinigera Sharpe, Cat. B. Br. Mus. III, p. 267; id. id. VI, p. 176; id. Ibis 1889, p. 277; Everett, L. B. Born. p. 117.

A great number of specimens collected on Mounts Kenepai and Liang Koeboeng, at Poelau in the Sibau Valley, and on the Upper Mahakkam. — Iris carmine, bill and legs black.

Hab. Sumatra and Borneo, where it is spread over the whole island.

Dicruridae.

120. *Dissemurus platurus*.

Dicrurus platurus Vieill. N. D. IX, p. 588 (1817).

Dissemurus brachyphorus Salvad. Ucc. Born. p. 154; Sharpe, Ibis 1889, p. 188.

Dissemurus platurus Büttik. N. L. M. 1887, p. 50; Everett, L. B. Born. p. 124.

Numerous specimens from Pontianak, Smitau, Nanga Raoen, Poetoes Sibau, Poelau and Long Bloe (Upper Mahakkam). — Iris reddish brown to blood-red, bill and feet black.

Hab. Malacca, Sumatra, Nias, Banka, Java, Borneo, where it is spread over the whole island.

I have looked over our large material from the above mentioned localities again and I am only strengthened in my opinion, expressed in the above mentioned paper on Sumatran birds, that the Bornean birds should not be separated under the name of *D. brachyphorus*.

Extract from Mr. von Berchtold's field-notes: »Ich habe sehr oft Gelegenheit gehabt zu beobachten, dass diese Vögel, namentlich vor der Abenddämmerung, sobald sie paarweise ihr Nachtquartier bezogen haben, die vorbeifliegenden Raubvögel unter heftigem Geschrei attackiren und dieselben eine kurze Strecke verfolgen.»

Laniidae.

121. *Hemipus obscurus*.

Muscicapa obscura Horsf. Trans. Linn. Soc. XIII, p. 146 (1822).

Notes from the Leyden Museum, Vol. XXI.

Miiolestes obscurus Salvad. Ucc. Born. p. 156.

Hemipus obscurus Sharpe, Cat. B. Br. Mus. III, p. 305; id. Ibis 1889, p. 189.

Two adult males and a female, all from Smitau, an adult male from Pontianak and three males and a female from the Upper Malakkam. — Iris dark brown, bill and feet black.

Hab. Malacca ¹⁾, Sumatra, Banka and Billiton (specimens in Mus. Lugd.), Java and Borneo, where it is spread throughout the island.

122. *Hemipus picatus*.

Muscicapa picata Sykes, P. Z. S. 1832, p. 85.

Hemipus intermedius Salvad. Ann. Mus. Civ. Gen. XIV (1879), p. 209 (Uccelli di Sumatra); Büttik. N. L. M. 1887, p. 51.

Hemipus picatus Sharpe, Ibis 1889, p. 189; Everett, L. B. Born. p. 123; Oates, Faun. Br. Ind. Birds, I, p. 471; Sharpe, Ibis 1892, p. 434; id. id. 1893, p. 551; id. id. 1894, p. 543.

Hemipus capitalis Hose, Ibis 1893, p. 395.

An immature male and two females obtained on the western slope of Mount Liang Koeboeng, at an altitude of 870 meter. — Iris dark brown, bill black, feet leaden gray. Living in the undergrowth of the virgin forest.

Hab. From South India and Ceylon eastwards through Burma and Tenasserim to Siam and Cochin China, Sumatra and Borneo. On the latter island it has been discovered by Mr. Whitehead on Mount Kina Balu, and was afterwards also found on Mount Dulit and Mount Mulu by Mr. Ch. Hose, and on Mount Penrisen and Mount Poeh by Mr. A. H. Everett.

The immature male is still wearing the plumage of the young bird, which does not differ from that of the female, but here and there on the brown head and back can be seen some beginnings of the glossy black plumage of the adult male. The rump in the male and both females is

1) According to Dr. Sharpe (l. c.) this species is found as far north as Tenasserim, but Mr. Oates, Fauna of Brit. India Birds, Vol. I, p. 473, believes that it does not range farther north than Malacca.

pure white with a few black cross-bars on the anterior part; the shorter upper tail-coverts are also white, while the longer are black like the three innermost pairs of tail-feathers. The three outer pairs of tail-feathers are black with white tip, which latter is largest on the outermost pair, where it has an extent of 3 cm. on the outer, and of about 2 cm. on the inner web. The basal third of the outer web is black. In one of the two females even the fourth pair are, though narrowly, tipped with white.

In a treatise on Sumatran birds (N. L. M. 1887, p. 52) I uttered some doubts as to the distinctness of *H. picatus*, *H. capitalis* and *H. intermedius*, and Dr. Sharpe (Ibis 1889, p. 190) believes that *H. picatus* and *H. capitalis* are identical. But in the same year, Mr. Oates (Faun. Brit. India Birds, I, p. 471) points out a constant distinguishing character, saying that the adult male of *H. picatus* has head and back glossy black, while in *H. capitalis* only the head and hind neck are black, strongly contrasting with the back, which is brown. As females and young birds of both species are alike, the difference is entirely based upon the color of the back in adult males. *Hemipus capitalis* is enumerated by Mr. Ch. Hose (Ibis 1893, p. 395) in his paper on the birds of Mount Dulit. But this is very probably a mistake, as the same bird is mentioned in a previous list (Ibis 1892, p. 434) as *H. picatus*. It is, on the contrary, very probable that *H. capitalis* does not exist in Borneo at all and that the only highland-form occurring on that island as well as in Sumatra belongs to *H. picatus*.

In my above mentioned paper on Sumatran birds I suggested that *H. intermedius* Salvad. might be identical with *H. picatus*. Count Salvadori (Uccelli di Sumatra, p. 209) says that *H. intermedius* agrees with *H. picatus* in the shining black color of the upper parts, while in the extent of the white tips to the tail-feathers it resembles *H. capitalis* from Nepal. But since there is, in fact, no difference in the extent of the white color on the tail between the mentioned species, this cannot be used as a distinguishing

character for *H. intermedius*, which agrees in every respect with the adult males of *H. picatus* from Burma, Sumatra and Borneo, contained in the Leyden Museum. Only the size of the type of *H. intermedius* (6,5 cm.) is rather surpassing the average size of *H. picatus*, but a male of the latter species from Burma, recently received in exchange from the British Museum, is quite as large, so that the size cannot form a distinguishing characteristical.

123. *Tephrodornis gularis*.

Lanius gularis Raffl. Trans. Linn. Soc. XIII, p. 304 (1822).

Tephrodornis gularis Salvad. Ucc. Born. p. 156; Büttik. N. L. M. 1887, p. 52¹⁾; Sharpe, Ibis 1889, p. 188; Everett, L. B. Born. p. 121.

Two specimens (male and female) from Mount Kenepai. Iris greenish yellow, bill black, feet gray.

Hab. Malacca, Sumatra and Borneo, where it seems to occur throughout the island.

124. *Lanius tigrinus*.

Lanius tigrinus Drap. Dict. Class. Hist. Nat. XIII, p. 523 (1828); Everett, L. B. Born. p. 121.

An immature female from the southern foot of Mount Kenepai and four specimens from the Upper Mahakkam. — Iris black, bill bluish white, feet gray.

Hab. From Eastern Asia through Malacca to Nias, Sumatra and throughout Borneo.

Paridae.

125. *Dendrophila corallipes*.

Dendrophila corallipes Sharpe, Ibis 1888, p. 479; id. id. 1889, p. 420; Everett, L. B. Born. p. 120.

An adult specimen, collected by the Controller Mr. Westenk at Sanggau. — Iris light yellow, eyelid, bill and feet coral-red.

1) I have once more compared our Sumatran specimens with those from Borneo and feel convinced now that they all belong to the present species.

Dicaeidae.126. *Prionochilus xanthopygius*.

Prionochilus xanthopygius Salvad. Atti R. Acad. Torino, III, p. 416 (1868); id. Ucc. Born. p. 162; Everett, L. B. Born. p. 140; Sharpe, Ibis 1889, p. 430; Büttik. in Weber, Zool. Ergebn. III, p. 302 (1894).

A great number of specimens from Roema Manoeal, Mount Kenepai, the valley of the Siniai, the Liang Koeboeng range and Nanga Raoen; also from the Upper Mahakkam. — Iris brown, bill black, lower mandible horny gray, feet gray.

Hab. Borneo.

127. *Prionochilus thoracicus*.

Pardalotus thoracicus Temm. Pl. Col. III. pl. 600, figs. 1 et 2 (1836).
Prionochilus thoracicus Strickl. P. Z. S. 1841, p. 29; Salvad. Ucc. Born. p. 163; Everett, L. B. Born. p. 140; Sharpe, Ibis 1889, p. 430; Büttik. in Weber, Zool. Ergebn. III, p. 302 (1894).

Eight specimens from Smitau and Roema Manoeal. — Iris, bill and feet black. — Two probably young, though full-grown specimens, which have been preserved in spirits, differ very much from both adult male and female, having the upper surface dark grayish olive-green, with hardly any indication of yellow on the centre of the crown, and the lower surface dark ashy gray, with yellowish white centre of breast and abdomen. Rump, upper- and under tail-coverts pale yellow, quills and tail-feathers black, the secondaries edged with green, under wing-coverts silky white, bill brown, angle of mouth and basal three thirds of lower mandible yellow. Having an adult male and female, also preserved in spirits, which are not altered at all in color, I may presume the same with regard to the two specimens which I have mentioned above as immature birds.

Hab. Malay Peninsula and Borneo.

Notes from the Leyden Museum, Vol. XXI.

128. *Prionochilus maculatus*.

Pardalotus maculatus Temm. Pl. Col. III, pl. 600, fig. 3 (1836).

Prionochilus maculatus Strickl. P. Z. S. 1841, p. 29; Salvad. Ucc. Born. p. 164; Sharpe, Ibis 1877, p. 17; Everett, L. B. Born. p. 140; Büttik. in Weber, Zool. Ergebn. III, p. 302 (1894).

Three specimens from Roema Manoeal, Nanga Raoen and Poelau, and eight specimens from the Upper Mahakkam. — Iris of the male reddish brown, of the female orange; bill black, lower mandible bluish gray, feet bluish gray.

Hab. Malay Peninsula, Sumatra and Borneo.

129. *Prionochilus ignicapillus*.

Dicaeum ignicapilla Eyton, P. Z. S. 1839, p. 105.

Prionochilus percussus W. Blasius, Verh. z. b. Ges. Wien, XXXIII, p. 54.

Prionochilus ignicapillus Everett, L. B. Born. p. 140; Büttik. in Weber, Zool. Ergebn. III, p. 302 (1894).

An adult male from Poelau. — Iris light brown, bill black, feet dark gray.

Hab. From Tenasserim down the Malay Peninsula to Sumatra and Borneo.

130. *Piprisoma Everetti*.

Prionochilus Everetti Sharpe, Ibis 1877, p. 16; id. P. Z. S. 1879, p. 345, pl. XXX, fig. 1; Everett, L. B. Born. p. 141; Sharpe, Ibis 1893, p. 553.

Piprisoma Everetti Büttik. in Weber, Zool. Ergebn. III, p. 303 (1894).

Adult male and female from Roema Manoeal, and four males from the Upper Mahakkam. — Iris yellow, brownish yellow or gray, bill and feet leaden gray. — The male is considerably larger than the female, the wing of the first measuring 6 cm., of the latter only 5,6; but in the color there is no difference whatever. From *P. obsoletum* (Müll. & Schl.), from Timor and Flores, the present species differs by wanting the white terminal spot on the inner web of the outermost tail-feathers.

Hab. The lowlands of Borneo: Labuan, Sarawak and the Kapoas basin.

131. *Dicaeum nigrimentum*.

Dicaeum nigrimentum Salvad. Ucc. Born. p. 165; Everett, L. B. Born. p. 139; Sharpe, Ibis 1889, p. 429.

A great number of specimens from Pontianak, Sanggau, Smitau, Roema Manoeal, Mount Kenepai, Nanga Raoen, Poelau and the Upper Mahakkam. — Iris, bill and feet black.

Hab. Malacca and Borneo.

132. *Dicaeum trigonostigma*.

Certhia trigonostigma Scop. Del. Flor. et Faun. Insubr. II, p. 91 (1786).
Dicaeum trigonostigma Salvad. Ucc. Born. p. 166; Everett, L. B. Born. p. 139; Sharpe, Ibis 1889, p. 429.

Numerous specimens from Sanggau, Smitau, Roema Manoeal, Mount Kenepai, Nanga Raoen, the Liang Koeboeng range, Poelau and the Upper Mahakkam. — Iris brown, bill black, base of lower mandible gray, feet gray.

Hab. From Burmah through Tenasserim and the Malayan Peninsula to Sumatra, Nias, the Batu Islands, Java and Borneo, where it is fairly common in and round the native settlements and in the jungle of abandoned plantations.

133. *Dicaeum chrysorrhoeum* ¹⁾.

Dicaeum chrysorrhoeum Temm. Pl. Col. IV, pl. 478, fig. 1 (1829);
Salvad. Ucc. Born. p. 168; Everett, L. B. Born. p. 139; Sharpe, Ibis 1889, p. 429.

Two specimens obtained at Sanggau (Westenck) and at Smitau, also from the Upper Mahakkam. — Iris red, gray or dark orange, bill and feet black. The difference in the color of the iris seems to be individual.

1) Mr. Everett, in his List of Birds of Borneo, doubts the occurrence of *Dicaeum flammeum* in Borneo as being not thoroughly stated by any good evidence, and for this reason omitted it in his list. Although not having obtained the species myself, I am much pleased to state that the collections in the Leyden Museum contain many specimens of this species, collected in South-Borneo by authorities as Schwane and Semmelink.

Hab. From the Eastern Himalayas through the Malay Peninsula to Sumatra, Java and Borneo.

134. *Dicaeum monticolum*.

Dicaeum monticolum Sharpe, Ibis 1887, p. 452; Everett, L. B. Born. p. 139.

Dicaeum monticola Sharpe, Ibis 1889, p. 428; id. id. 1890, p. 287, pl. VIII, figs. 1 and 2; Hose, Ibis 1893, p. 400.

An adult male obtained on the Liang Koeboeng range. — Iris dark brown, bill black, feet dark gray.

Hab. Mountain-regions of Borneo: Kina Balu, mountains of Sarawak and Liang Koeboeng.

Nectariniidae.

135. *Aethopyga Temmincki*.

Nectarinia Temmincki S. Müll. Nat. Gesch., Land- en Volkenk. p. 173 (1843).

Aethopyga Temmincki Everett, L. B. Born. p. 135; Sharpe, Ibis 1889, p. 421 (first description of the female).

An adult male and two adult females from the western slope of the Liang Koeboeng range, and an adult female from Mount Kenepai. Here may also be remembered the adult male, observed on the summit of Mount Kenepai and mentioned in my general introduction (N. L. M. 1897, p. 13). This species is a mountain form, representing the lowland-form *A. siparaja* in the higher regions of Mounts Kenepai and Liang Koeboeng. The female of the present species, for the first time described by Sharpe (see above), is easily distinguished from that of *A. siparaja* by the orange-red outer edgings to the quills and tail-feathers, and by the shorter tail, measuring only 2,5 cm. instead of 3,3. The Nos 999 and 1000 from Liang Koeboeng are probably matched male and female, shot together on a high tree. — Iris dark brown, bill black, lower mandible paler, feet brown.

Hab. Sumatra and Borneo. On the latter island found

on the Kina Balu and on the mountains of Sarawak, above an elevation of 2000 feet.

136. *Aethopyga siparaja*.

Certhia siparaja Raffles. Trans. Linn. Soc. XIII, p. 299 (1822).

Aethopyga eupogon Salvad. Ucc. Born. p. 173.

Aethopyga siparaja Everett, L. B. Born. p. 135; Sharpe, Ibis 1889, p. 422.

Numerous specimens of both sexes from Pontianak, Roema Manoeal, Nanga Raoen and Poelau; also from the Upper Mahakkam. — Iris brown, bill black, lower mandible in the female brown, feet brown.

H a b. Malacca and the Sunda Islands.

137. *Chalcostetha insignis*.

Nectarinia insignis Jard. Mon. Sun-birds, p. 274 (1842).

Chalcostetha insignis Salvad. Ucc. Born. p. 177; Everett, L. B. Born. p. 135; Sharpe, Ibis 1889, p. 422.

An adult male, collected by Moret at Pontianak.

H a b. From South China through the Malay Peninsula and the Philippines to the Sunda Islands and Celebes.

138. *Cinnyris Hasselti*.

Nectarinia Hasselti Temm. Pl. Col. 376, fig. 3 (1825).

Nectarophila Hasselti Salvad. Ucc. Born. p. 177.

Cinnyris Hasselti Everett, L. B. Born. p. 136; Sharpe, Ibis 1889, p. 423.

Two adult males from Roema Manoeal. — Iris brown, bill and feet black.

H a b. Malay Peninsula and Sunda Islands.

139. *Cinnyris pectoralis*.

Nectarinia pectoralis Horsf. Trans. Linn. Soc. XIII, p. 167 (1822).

Cyrtostomus pectoralis Salvad. Ucc. Born. p. 170.

Cinnyris pectoralis Everett, L. B. Born. p. 136; Sharpe, Ibis 1889, p. 423.

Adult male and female, obtained at Smitau. — Iris, bill and feet black.

Hab. Malay Peninsula, Sunda Islands and the Nicobars.

140. *Anthreptes malaccensis*.

Certhia malaccensis Scop. Del. Flor. et Faun. Insubr. II, p. 91 (1787).

Anthreptes malaccensis Salvad. Ucc. Born. p. 178; Everett, L. B. Born. p. 137; Sharpe, Ibis 1889, p. 424.

A great number of specimens from Pontianak, Smitau, Roema Manoal, Mount Kenepai, Nanga Raoen and Poelau, also from the Upper Mabakkam. Common in plantations and brushwood. — Iris red, in young specimens brown, bill black, feet olive-brown, soles yellow; in young specimens the feet are entirely orange.

Hab. Malay Peninsula, Siam, Sumatra, Nias, Java to Flores, Southern Philippine Islands, Borneo.

141. *Anthreptes hypogrammica*.

Nectarinia hypogrammica S. Müll. Nat. Gesch., Land- en Volkenk. p. 173 (1843).

Hypogramma nuchalis Salvad. Ucc. Born. p. 172.

Anthreptes hypogrammica Everett, L. B. Born. p. 136.

Four specimens from Mount Kenepai and the Liang Koeboeng range, where it is found in the crowns of high trees; also from the Upper Mahakkam. — Iris dark brown, bill black, feet olive-green, soles yellow.

Hab. Malay Peninsula, Sumatra and Borneo.

142. *Anthreptes simplex*.

Nectarinia simplex S. Müll. Nat. Gesch., Land- en Volkenk. p. 173 (1843).

Arachnophila simplex Salvad. Ucc. Born. p. 172.

Anthreptes simplex Everett, L. B. Born. p. 136.

Numerous specimens from Roema Manoal, Mount Kenepai, the Liang Koeboeng range, Poelau and the Upper Sibau River, also from the Upper Mahakkam. — Iris reddish brown, bill black, feet brown, soles yellow.

Hab. Nias, Sumatra and Borneo, where it is distributed over the whole island.

143. *Anthreptes rhodolaema*.

Anthreptes rhodolaema Shelley, Mon. Nect. p. 313, pl. 101, fig. 1 (1878); Sharpe, Ibis 1879, p. 260; Everett, L. B. Born. p. 137.

Four adult males and a female from Pontianak, Smitau and Roema Manoel, and an adult male from the Upper Mahakkam. — Iris red, bill black, feet olive-brown, soles yellow. — This species is easily distinguished from *A. malaccensis* by the red instead of olive tinge of the sides of the head, the great extent of the red color on the wing-coverts, the absence of purplish blue on upper back and mantle, and by the green instead of yellow color of the lower surface. In the above-mentioned localities it is generally found together with *A. malaccensis*. Captain Shelley, who in his above-mentioned monograph was the first to separate it from *A. malaccensis*, mentions as habitat of the present species Malacca and Sumatra, but the Leyden Museum is in possession of a great number of specimens from Borneo, which island is for the first time mentioned as the habitat of this species by Dr. Sharpe (l. c.).

Hab. Malay Peninsula, Sumatra and Borneo.

144. *Anthreptes phoenicotis*.

Nectarinia phoenicotis Temm. Pl. Col. 108, fig. 1, 388, fig. 2 (1824).

Chalcopteryx singalensis Salvad. Ucc. Born. p. 180.

Anthreptes phoenicotis Everett, L. B. Born. p. 137; Sharpe, Ibis 1889, p. 425.

Twelve specimens from Roema Manoel, the Liang Koeboeng range, Nanga Raoen and Poelau, and seven from the Upper Mahakkam. — Iris reddish brown, bill black, feet olive-brown, soles yellow.

Hab. From Bhutan through the Malay Peninsula and the Sunda Islands.

145. *Arachnothera modesta*.

Anthreptes modesta Eyton, P. Z. S. 1839, p. 105.

Arachnothera modesta Salvad. Ucc. Born. p. 183; Büttik. N. L. M. 1887, p. 57; Everett, L. B. Born. p. 137.

Three specimens from Pontianak and Mount Kenepai. — Iris brown, bill brown, lower mandible horny, feet flesh-color.

Hab. Malay Peninsula, Sumatra (Mus. Lugd., see my above-quoted comparative note on *A. modesta* and *A. affinis*) and Borneo.

146. *Arachnothera Everetti*.

Arachnothera modesta Sharpe, Ibis 1889, p. 425.

Arachnoraphis Everetti Sharpe, Ibis 1893, p. 561; Whitehead, Ibis 1894, p. 316.

An adult female from the Liang Koeboeng range and an adult male from the Upper Mahakkam, collected by Dr. Nieuwenhuis in January 1899. — Iris brown, bill black, lower mandible horny, feet flesh-color.

Hab. Mountain regions of Borneo: Kina Balu (Whitehead), Mount Penrisen (A. H. Everett) and the two above-mentioned localities.

This species stands between *A. modesta* and the Javanese *A. affinis*. With the first it agrees in the olive-green (not golden green) tinge on the upper surface, and with the latter in showing the dark shaft-streaks more distinctly and extending also over the abdomen, and in being larger than *A. modesta*. The single specimen obtained on the Liang Koeboeng agrees fairly well with a specimen from the Kina Balu in the Leyden Museum but is somewhat less strongly striped and somewhat smaller. It must be observed, however, that the size is not very constant in either of these species, and that the stronger shaft-streaks do not hold well in all the specimens of the present species, so that the validity of this species seems somewhat doubtful. According to Mr. Whitehead (l. c.) the specimens from the Kina Balu, enumerated by Sharpe in

Ibis 1889, p. 425, under the name of *A. modesta*, belong to the present species, which, on account of the ridged culmen, is a true *Arachnothera*. I may be allowed to remember, that the Sumatran specimens in the Leyden Museum, from the Highlands of Padang (Dr. Klaesi) and Deli (Dr. Hagen), belong to *A. modesta* and not to *A. affinis*, which latter species seems to be restricted to Java.

147. *Arachnothera longirostris*.

Certhia longirostra Lath. Ind. Orn. I, p. 299 (1790).

Arachnothera longirostris Salvad. Ucc. Born. p. 186; Everett, L. B. Born. p. 137; Sharpe, Ibis 1889, p. 426.

A great number of specimens from Pontianak, Mount Kenepai, Nanga Raoen, Liang Koeboeng range, Poelau and the Upper Mahakkam. — Iris brown, bill black, lower mandible bluish white, feet grayish blue.

Hab. From British India through the Malay Peninsula to the Sunda Islands and Celebes? ¹⁾.

148. *Arachnothera chrysoyenys*.

Arachnothera chrysoyenys Temm. Pl. Col. 388, fig. 1 (1826); Salvad. Ucc. Born. p. 181; Everett, L. B. Born. p. 138; Sharpe, Ibis 1889, p. 426.

Six specimens from Roema Manoal, Poetoes Sibau and Poelau, and a female from the Upper Mahakkam. — Iris dark brown, bill black, edge of upper mandible yellow on the basal half, feet flesh-color. The »Hisiet'' is considered to be a sacred bird by the Mahau of the Upper Mahakkam.

Hab. Malay Peninsula and the Sunda Islands.

149. *Arachnoraphis robusta*.

Arachnothera robusta S. Müll. & Schleg. Verh. Nat. Gesch. p. 68,

1) This species is said by Müller & Schlegel (Verhand. Aves, p. 69), and upon their authority by other ornithologists, to be found also in Celebes. This opinion is based upon a specimen in the Leyden Museum, labelled »Forsten, Celebes'', but no other evidence being known as to its occurrence on that island, the provenience of the specimen in question must be considered as very doubtful.

pl. 11, fig. 1 (1846); *Salvad. Ucc. Born.* p. 184; Büttik. N. L. M. 1887, p. 56.

Arachnoraphis robusta Everett, L. B. *Born.* p. 138.

An adult male from the western slope of the Liang Koeboeng range. — Iris dark brown, bill black, feet dark grayish green, soles ochraceous.

Hab. Malay Peninsula, Sumatra (Dr. Klaesi), Java and Borneo.

150. *Arachnoraphis crassirostris*.

Arachnocestra crassirostris Reichenb. *Handb. Scansoriae*, p. 314, N° 747, pl. 592, fig. 4016 (1854).

Arachnothera crassirostris *Salvad. Ucc. Born.* p. 187.

Arachnoraphis crassirostris Everett, L. B. *Born.* p. 138.

Three specimens from Roema Manoeal and the Liang Koeboeng range, also from the Upper Mahakkam. — Iris dark brown, bill black, base of lower mandible brownish gray, feet grayish olive, soles ochraceous.

Hab. Malay Peninsula, Sumatra and Borneo.

151. *Arachnoraphis flavigaster*.

Anthreptes flavigaster Eyton, P. Z. S. 1839, p. 105.

Arachnothera Eytoni, *Salvad. Ucc. Born.* p. 182.

Arachnoraphis flavigaster Everett, L. B. *Born.* p. 138.

Two specimens from the Liang Koeboeng range. — Iris dark brown, bill black, lower mandible brown, feet ochraceous.

Hab. Malacca, Sumatra and Borneo.

Melliphagidae.

152. *Zosterops squamifrons*.

Zosterops squamifrons Sharpe, *Ibis* 1892, pp. 323 and 436; Whitehead, *Ibis* 1893, p. 281; Hose, *Ibis* 1893, p. 401; Sharpe, *Ibis* 1893, pp. 552 and 561.

Two males and a female, obtained on Mount Kenepai, at an altitude of 600 meters. — Iris grayish or yellowish

white, bill black, feet grayish green. Male and female of this aberrant species of *Zosterops* are quite similar in color and size.

Hab. Mountain-forests of Borneo (Kina Balu, most of the mountains of Sarawak, and Mount Kenepai).

153. *Aegithina viridis*.

Iora viridis Bp. Consp. I, p. 397, ex Temm. MS. in Mus. Lugd.

Iora scapularis Salvad. Ucc. Born. p. 190; Sharpe, Ibis 1877, p. 14; id. P. Z. S. 1879, p. 339 (with description of the egg).

Aegithina viridis Tweedd. Ibis 1877, p. 304; id. P. Z. S. 1878, p. 619; Sharpe, Cat. B. Br. Mus. VI, p. 11; id. Ibis 1889, p. 271; Everett, L. B. Born. p. 116.

A great number of this lowland-bird collected in plantations and brush-wood at Smitau, Nanga Raoen and Poelau. — Iris white, bill horny blue, feet gray. A female nestling, obtained at Nanga Raoen, is quite similar in color to the adult female. Iris brown.

Hab. Sumatra, Palawan and Borneo.

154. *Aegithina viridissima*.

Iora viridissima Bp. Consp. I, p. 397 (1850); Salvad. Ucc. Born. p. 192.

Aegithina viridissima Tweedd. Ibis 1877, p. 304, pl. 5; Sharpe, Cat. B. Br. Mus. VI, p. 6; id. Ibis 1889, p. 271; Everett, L. B. Born. p. 116.

An adult male from the southern foot of Mount Kenepai and an adult female from Pontianak; two specimens from the Upper Mahakkam. — Iris in male and female brown, bill and feet bluish gray.

Hab. Malay Peninsula, Sumatra and the lowlands of Borneo.

155. *Chloropsis zosterops*.

Chloropsis zosterops Vigors, App. Mem. Life Raffl. p. 674 (1830);

Sharpe, Cat. B. Br. Mus. VI, p. 24; id. Ibis 1889, p. 271; Everett, L. B. Born. p. 116.

Iora viridissima Salvad. Ucc. Born. p. 192.

Iora sp.? Salvad. Ucc. Born. p. 191.

A great number collected at Smitau, on the southern foot of Mt Kenepai, in the forests on Mt Kenepai, on the Liang Koeboeng mountains, at Nanga Raoen and near Poelau; also from the Upper Mahakkam. A regular forest-bird. — Iris brown, bill black, base of lower mandible in the female horny blue, feet grayish blue.

Hab. From Tenasserim down the Malay Peninsula to Sumatra and Borneo.

156. *Chloropsis cyanopogon*.

Phyllornis cyanopogon Temm. Pl. Col. 512, fig. 1 (1829); Salvad. Ucc. Born. p. 194.

Chloropsis cyanopogon Sharpe, Cat. B. Br. Mus. VI, p. 32; id. Ibis 1889, p. 272; Everett, L. B. Born. p. 116.

Ten specimens collected at Sanggau, Smitau, on Mt Kenepai from the foot up to an altitude of 800 meter, on the Liang Koeboeng and in the Sibau valley, also from the Upper Mahakkam. — Iris dark brown, bill black, lower mandible gray, feet gray.

Hab. From Tenasserim down the Malay Peninsula to Sumatra and Borneo, where it seems to be spread over the whole island.

157. *Chloropsis viridinucha*.

Phyllornis icterocephala (nec Less.) Salvad. Ucc. Born. p. 195 (1874).

Phyllornis viridinucha Sharpe, Ibis 1877, p. 15; Tweedd. Ibis 1877, p. 305; Sharpe, Ibis 1878, p. 414.

Chloropsis viridinucha Sharpe, Cat. B. Br. Mus. VI, p. 31; Everett, L. B. Born. p. 117; Hose, Ibis 1893, p. 392.

An adult male and female obtained on Mount Kenepai, and another male on Mount Liang Koeboeng; also from the Upper- and Lower Mahakkam. — Iris dark brown, bill black, feet grayish blue, soles ochre. — Contents of stomach: Insects and fruits.

Hab. Restricted to Borneo, where it represents *Ch. icterocephala* from Malacca and Sumatra.

Brachypodidae.158. *Trachycomus ochrocephalus*.

Turdus ochrocephalus Gm. Syst. Nat. I, p. 821 (1788).

Trachycomus ochrocephalus Cab. Mus. Hein. I, p. 109 (1850); Salvad. Ucc. Born. p. 196; Sharpe, Cat. B. Br. Mus. VI, p. 93; id. Ibis 1889, p. 275; Everett, L. B. Born. p. 114.

An adult female from Smitau, on the Kapoeas River; also from the Upper- and Lower Mahakkam. — Iris dark brown, bill and feet black.

Hab. From Tenasserim down the Malay Peninsula to Sumatra, Java and Borneo, where the species is spread over the whole island.

159. *Laedorusa analis*.

Turdus analis Horsf. Trans. Linn. Soc. XIII, p. 147 (1822).

Pycnonotus gourdini Bp. Consp. I, p. 266; Salvad. Ucc. Born. p. 198.

Pycnonotus analis Sclater, P. Z. S. 1863, p. 216; Salvad. Ucc. Born. p. 197; Sharpe, Cat. B. Br. Mus. VI, p. 140; id. Ibis 1889, p. 275; Everett, L. B. Born. p. 114.

Laedorusa analis Büttik. N. L. M. 1895/6, p. 239.

Eight specimens from Pontianak, Smitau, Nanga Raoen and Poelau, all in the large plain of the Upper Kapoeas River, where the species is found in the jungle of abandoned plantations and low forest. A female was obtained on the Upper Mahakkam. — Iris dark brown, bill black, feet grayish black.

Hab. From Tenasserim throughout the Malay Peninsula, Sumatra, Billiton, Java, Lomboek, Borneo and Labuan. In Borneo it is a rather common lowland-species, in the North as well as in the extreme South of the island.

160. *Laedorusa plumosa*.

Pycnonotus plumosus Blyth, J. A. S. Beng. XIV, p. 567 (1845); Salvad.

Ucc. Born. p. 198; Sharpe, Cat. B. Br. Mus. VI, p. 152; Everett, L. B. Born. p. 114.

Laedorusa plumosa Büttik. N. L. M. 1895/6, p. 240.

An adult female from Poelau; another female, with nest and eggs, from the Upper Sibau River. — Iris fire-red, bill black, feet flesh-color. — The nest is placed in shrubs about three or four feet above the ground and consists of a nice and rather deep cup of rootlets, grass-stems and broad leaves; its size is about that of a Finch's nest.

Hab. Tenasserim and Malay Peninsula, Nias, Sumatra and Borneo.

161. *Laedorusa simplex*.

Pycnonotus simplex Less. Rev. Zool. 1839, p. 167; Sharpe, Cat. B. Br. Mus. VI, p. 153; id. Ibis 1889, p. 276; Everett, L. B. Born. p. 115.

Laedorusa simplex Büttik. N. L. M. 1895/6, p. 240.

A great series collected at Pontianak, Smitau, Roema Manoeal, Mounts Kenepai and Liang Koeboeng, in the Sibau valley, and at Long Bloe, Upper Mahakkam. — Iris red, bill black, feet pale brown. — This species is very easily mistaken for *Iole olivacea* from which it can hardly be distinguished in color; but it is of a considerably smaller size, the bill is much smaller and less stretched, and the iris is red instead of white.

Hab. From Tenasserim down the Malay Peninsula, Nias, Sumatra, Java and Borneo, where it is distributed over the whole island.

162. *Laedorusa pusilla*.

Pycnonotus simplex (nec Less.) Bp. Consp. I, p. 263 (ex Kuhl M. S. in Mus. Lugd.).

Pycnonotus pusillus (nec Blyth) Salvad. Ucc. Born. p. 200 (1874); Sharpe, Cat. B. Br. M. VI, p. 155.

Pycnonotus Salvadorii Sharpe, Cat. B. Br. Mus. VI, p. 401; Everett, L. B. Born. p. 115; Hose, Ibis 1893, p. 391; Sharpe, Ibis 1893, pp. 547 and 551.

Laedorusa pusilla Büttik. N. L. M. 1895/6, p. 241.

A great number of specimens from Mounts Kenepai and Liang Koeboeng, from the Sibau River and the Upper

Mahakkam, found in the undergrowth of high forest. — Iris red (in an immature specimen brown), eyelid, angle of the mouth and nasal groove orange-yellow, bill black, feet fleshy brown, soles ochre. — This smallest of all the species of this genus is easily recognized by the orange-yellow eyelid, the sulphur-yellow under wing-coverts, ashy white throat (never tinged with brown or olive), the more slender and shorter bill and the small size.

Hab. From Tenasserim down the Malay Peninsula to Sumatra and Borneo.

163. *Pinarocichla euptilosa*.

Brachypus euptilosus Jard. & Selby, Ill. Orn. IV, pl. III (1825?);

Salvad. Ucc. Born. p. 219.

Criniger Suzanii (Müll.) Salvad. Ucc. Born. p. 207.

Criniger tristis Brügg. Abh. Nat. Ver. Brem. V, p. 459 (1877).

Pinarocichla euptilosa Sharpe, Cat. B. Br. Mus. VI, p. 62; Everett,

L. B. Born. p. 112; Büttik. N. L. M. 1895/6, p. 246.

Five specimens, collected in the forests on the western slope of Mount Liang Koeboeng, 700—800 m. above the sea, and eight specimens from the Upper Mahakkam. — Iris red, bill black, feet dark grayish brown.

Hab. Malay Peninsula, Sumatra and Borneo.

164. *Mesolophus montis*.

Rubigula montis Sharpe, P. Z. S. 1879, p. 247; id. Ibis 1889, p. 276

Everett, L. B. Born. p. 115; Sharpe, Ibis 1892, p. 433; Hose,

Ibis 1893, p. 392; Sharpe, Ibis 1894, p. 543.

Otocompsa montis Sharpe, Cat. B. Br. Mus. VI, p. 162.

Mesolophus montis Büttik. N. L. M. 1895/6, p. 248.

A single specimen, shot on the top-plateau of the Liang Koeboeng (1300 m. above the sea), in low forest. A very lively and noisy bird, constantly moving up and down its long black crest when in excitement. — Iris brown, bill and feet black. — This species is decidedly a mountain-bird.

Hab. Borneo: Kina Balu, Mountains of Sarawak (Mt. Mulu and Mt. Dulit), and Liang Koeboeng.

This species is the Bornean representative of *M. flaviventris* from the Continent, from which species it differs by its smaller size and the want of black on chin and throat.

165. *Ixidia cyaniventris*.

- Pycnonotus cyaniventris* Blyth, J. A. S. Beng. XI, p. 792 (1842).
Ixidia cyaniventris Bp. Consp. I, p. 260; Büttik. N. L. M. 1895/6, p. 249.
Brachypus poliopsis Bp. Consp. I, p. 264 (ex. Müll. MS. in Mus. Lugd.).
Ixidia paroticalis Sharpe, Ibis 1878, p. 418; id. id. 1879, p. 256.
Rubigula cyaniventris Sharpe, Cat. B. Br. Mus. VI, p. 169.
Rubigula paroticalis Sharpe, Cat. B. Br. Mus. VI, p. 170; Everett, L. B. Born. p. 115; Hose, Ibis 1893, p. 391; Sharpe, Ibis 1893, pp. 547 and 551; id. Ibis 1894, p. 543.

Adult male and female from Mount Liang Koeboeng, where the species is found in the undergrowth of the high forest; also from Long Bloe. — Iris dark brown or gray, bill black, feet pale blue, soles ochre. — The above-mentioned two birds are similar in every respect to four specimens of *R. cyaniventris* from Sumatra and one from Malacca in the Leyden Museum, so that I am absolutely unable to find distinguishing characters. Those mentioned by Sharpe in his above-quoted Catalogue do not hold at all in the specimens which I have before me. The larger size of the Bornean specimens is mentioned by Sharpe as the strongest argument for a specific separation, but the following measurements will show that this argument does not hold with the specimens in the Leyden Museum.

	Wing.	Tail.	Tarsus.	Culmen.
Borneo (<i>R. paroticalis</i>)	2,7—2,8 inches;	2,0	; 0,6	; 0,55.
Sumatra (<i>R. cyaniventris</i>)	2,8—2,9	» ; 2,2—2,5;	0,55—0,65;	0,6 .
Malacca (» »)	3,05	; 2,4	; 0,6	; 0,6 .

Hab. Tenasserim, Malay Peninsula, Sumatra and Borneo, where it was hitherto only recorded from Sarawak.

166. *Iridia Webberi*.

Iridia squamata (nec Temm.) Salvad. Ucc. Born. p. 200; Sharpe, Ibis 1878, p. 419.

Iridia Webberi Hume, Str. Feath. VIII, pp. 40 and 63 (1879); Büttik. N. L. M. 1895/6, p. 250.

Rubigula Webberi Sharpe, Cat. B. Br. Mus. VI, p. 171; Everett, L. B. Born. p. 115.

Four specimens from Mounts Kenepai and Liang Koe-boeng, where it was found in high forest. — Iris red, bill and feet black.

Hab. Malay Peninsula, Sumatra and Borneo (Sarawak and Central Borneo).

167. *Brachypodius melanocephalus*.

Lanius melanocephalus Gm. Syst. Nat. I, p. 309 (1788).

Brachypodius melanocephalus Blyth, J. A. S. Beng. XIV, p. 576; Salvad. Ucc. Born. p. 201; Büttik. N. L. M. 1895/96, p. 251.

Micropus melanocephalus Sharpe, Cat. B. Br. Mus. VI, p. 65; id. Ibis 1889, p. 274; Everett, L. B. Born. p. 112.

Microtarsus melanocephalus Sharpe, Ibis 1894, p. 422.

Seven specimens from Mount Kenepai, the Siniai Valley, Nanga Raoen and the Sibau River, and ten specimens from the Upper Mahakkam. — A lowland-species, living in low jungle and in the undergrowth of high forest. — Iris grayish blue, bill black, feet grayish black.

There is, amongst my specimens, considerable difference in the metallic color of the head, which is steel green in some specimens and glossy purplish blue in others. The two specimens with the glossy green heads are a little larger and paler green than the others. These differences seem to be independant from sex and locality. A young female has the head green like the rest of the upper surface.

Hab. From Tenasserim down the Malay Peninsula to Sumatra, Java, Borneo and Labuan. In Borneo it is spread over the whole island.

168. *Microtarsus melanoleucus*.

Microtarsus melanoleucus Eyt. P. Z. S. 1839, p. 102; Salvad. Ucc. Born. p. 202; Büttik. N. L. M. 1895/6, p. 252.

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Micropus melanoleucus Sharpe, Cat. B. Br. Mus. VI, p. 69; id. Ibis 1889, p. 274; Everett, L. B. Born. p. 112.

An adult female from the southern foot of Mount Kenepai and an adult male from Nanga Raoen, both shot in brushwood, and two specimens from the Upper Mahakkam. — Iris, bill and feet black. The adult female has the lower surface less dark brown than the male. An immature specimen in the Leyden Museum, from Sumatra, has the upper surface earthy brown, the feathers being broadly edged with olive-brown, while the lower surface is olive-gray. The white patch on the wing is only indicated by a few white feathers.

Hab. Malay Peninsula, Sumatra (Müller, Horner) and Borneo, where it seems to be spread over the whole island. One of the specimens in the Leyden Museum was collected at Koetei on the east-coast and presented by Dr. Vorderman.

169. *Hemixus malaccensis*.

Hypsipetes malaccensis Blyth, J. A. S. Beng. XIV, p. 574 (1845); Salvad. Ucc. Born. p. 202; id. Ann. Mus. Civ. Stor. Nat. Genova, XIV, p. 221 (1879); Sharpe, Ibis 1879, p. 256.

Trichophorus striolatus (ex Müll. M. S.) Bp. Consp. I, p. 262.

Hemixus malaccensis Sharpe, Cat. B. Br. Mus. VI, p. 52; Büttik. N. L. M. 1887, p. 63; Everett, L. B. Born. p. 111; Sharpe, Ibis 1889, p. 274; id. id. 1890, p. 277.

Hemixus sumatranus Ramsay, Ann. Mag. Nat. Hist. 1882, p. 431; Nicholson, Ibis 1883, p. 246; Salvad. Ann. Mus. Civ. Stor. Nat. Genova, XXV, p. 525 (1887/88).

Hemixus striolatus (part.) Salvad. op. cit. XXXII, p. 61 (1892).

A great series collected on Mount Kenepai and Mount Liang Koeboeng. Found in the low bamboo jungle as well as in the high forest. — Iris brown, bill black, base of lower mandible horny white, feet grayish brown.

Hab. Malay Peninsula, Sumatra, Central, Western and Northern Borneo. — Ramsay, and after him Nicholson and Salvadori (l. c.) have separated the Sumatran specimens from those from Malacca and Borneo under the name of *H. sumatranus*, and later on (l. c.) Salvadori identified this

species with *H. striolatus* (Bp.), the types of which are in the Leyden Museum. Both Ramsay and Salvadori stated that their specimens from Western Sumatra differ from the Malaccan and Bornean birds in the following essential points: Upper surface olive-brown instead of olive-green, and the white-striped throat, chest and upper breast olive-green like in *H. virescens* instead of ashy olive. I regret to say that, after having looked over our material again and compared it with my Bornean specimens, I am unable to alter my former opinion (N. L. M. 1887, p. 63) as to the specimens from Sumatra in the Leyden Museum. Our types of *Trichophorus striolatus* as well as the specimens collected by Dr. Klaesi in the Highlands of Padang have throat, chest and upper breast ashy gray with an olive tinge, while, according to Ramsay and Salvadori, they ought to be olive-green. As to the color of the upper surface, I must say that in our stuffed typical specimens it yields somewhat to olive-brown, but this very slight difference is probably due to their having been exposed to the light for more than fifty years in our galleries. Dr. Klaesi's birds are olive-green above like those I have obtained in Borneo.

Strange enough Nicholson, who described the birds collected in Sumatra by Mr. H. O. Forbes (*Ibis* 1883, p. 246), says that the Sumatran birds have throat and breast streaked with white as in *H. malaccensis*, but that the edgings of the feathers are olive-brown instead of greenish, and that the head is brown, characters which neither agree with those given by Ramsay and Salvadori, nor with *H. malaccensis* which has a green head and ashy gray edgings to the breast-feathers.

The birds described by Ramsay and Salvadori are collected on Mount Singalang at a height of about 1600 m., and near the Lake Toba about 1500 m. above the sea. Having never seen one of those green-breasted specimens from Sumatra, I cannot tell much about their identity with *H. malaccensis*, but all our Sumatran specimens in the Leyden Museum, with the inclusion of the types of *Tri-*

chophorus striolatus, certainly belong to this latter species, as they cannot be distinguished from Malaccan and Bornean specimens.

170. *Hemixus connectens*.

Hemixus connectens Sharpe, Ibis 1887, p. 446; id. id. 1889, p. 273; id. id. 1892, p. 433; Everett, L. B. Born. p. 111.

Six specimens obtained on the western slope of Mount Liang Koeboeng, at an altitude of 800 m. above the sea. It inhabits the undergrowth of the high forest. — Iris grayish brown, bill black, feet gray.

Hab. The mountainous regions of Borneo. Whitehead discovered it on the Kina Balu, where it lives at an elevation from 1000 to 2600 m.; Mr. Hose found it on Mount Dulit and other Sarawak Mountains, about 1000 m. above the sea.

171. *Trichophoropsis typus*.

Trichophoropsis typus Bp. Comptes Rendus, 1854, p. 59; Salvad. Ucc. Born. p. 203; Sharpe, Cat. B. Br. Mus. VI, p. 88; Everett, L. B. Born. p. 113.

Criniger Bemmeleni Finsch, J. f. O. 1867, p. 29.

A single specimen (♂) obtained at the southern foot of Mount Kenepai. — Iris brown, bill horny gray, feet gray.

Hab. Sarawak and the central region of Borneo with inclusion of Moeara Teweh on the Upper Barito River.

172. *Tricholestes criniger*.

Brachypodius? criniger Blyth, J. A. S. Beng. XIV, p. 577 (1845).

Tricholestes minutus Salvad. Ucc. Born. p. 205, pl. V, fig. 1; Sharpe, Ibis 1877, p. 14; id. Ibis 1879, p. 257.

Tricholestes criniger Tweedd. Ibis 1877, p. 306; Sharpe, Cat. B. Br. Mus. VI, p. 89; id. Ibis 1889, p. 275; Everett, L. B. Born. p. 114.

Seven specimens from Mounts Kenepai and Liang Koeboeng; also from Long Bloe, Upper Mahakkam. Exclusively a forest-bird. — Iris dark brown, bill horny gray, feet yellowish flesh-color.

Hab. Malay Peninsula, Sumatra, Java and Borneo. On this latter island it was hitherto recorded from the North-east, the North and the North-west.

173. *Criniger gutturalis*.

Trichophorus gutturalis Bp. Consp. I, p. 262 [ex. Müll. M. S. in Mus. Lugd.] (1850).

Criniger gutturalis Scat. P. Z. S. 1863, p. 216; Finsch, Journ. f. Orn. 1867, p. 15 (partim); Salvad. Ucc. Born. p. 206 (partim); Sharpe, Cat. B. Br. Mus. VI, p. 80 (partim); Everett, L. B. Born. p. 113.

A great series of specimens from Mts. Kenepai and Liang Koeboeng, and from the Upper Mahakkam, where it is found in low jungle as well as in high forest. — Iris reddish brown, bill horny blue, feet pale flesh-color.

Hab. From Tenasserim throughout the Malay Peninsula, Malacca, Sumatra and Borneo.

Wardlaw Ramsay (Ann. Mag. Nat. Hist. 1882, p. 431) described 11 Sumatran birds, collected by Karl Bock, as belonging to a new species, which he called *C. sumatranus*, and which would represent *C. gutturalis* in Sumatra. The material in the Leyden Museum evidently shows that *C. sumatranus* is a valid species, distinguished from *C. gutturalis* by an olive-brown instead of reddish brown crown and a somewhat longer occipital crest, by more richly developed and pure white feathers on chin and throat, and by having the under tail-coverts darker reddish ochraceous. To *C. sumatranus* belong also the specimens collected by Dr. Klaesi in the Highlands of Padang and wrongly (see also Salvadori, Ucc. di Sumatra, in Ann. Mus. Gen. 1892, p. 61) mentioned by me as *C. gutturalis* in N. L. M. 1887, p. 64, though their under tail-coverts do not differ in color from those in our series of *C. gutturalis* from Borneo.

On the other hand I learn from the specimens in the Leyden Museum, that *C. sumatranus* does not represent *C. gutturalis*, but is found together with this latter species in Sumatra. Besides the typical specimens from

Borneo our collections contain two specimens of the true *C. gutturalis* from Sumatra, both collected by S. Müller.

As to *C. sumatranus*, our Museum is in possession of an adult male, collected by S. Müller in Sumatra and strange enough, of another, also of an early date, said to come from Borneo. This latter fact is the more strange, as from Borneo was already known a second species of *Criniger*, *C. ruficrissus*, which would take a similar position in Borneo as *C. sumatranus* in Sumatra. It must be left to later investigations to make out whether *C. sumatranus* is really an inhabitant of Borneo as indicated by that single specimen in the Leyden Museum.

Finsch (l. c.), in describing his *C. gutturalis* after the specimens in the Leyden Museum, used as objects the male of *C. sumatranus* and a female of *C. gutturalis*, as we learn from his remarks about the female.

174. *Criniger ruficrissus*.

Criniger gutturalis Salvad. Ucc. Born. p. 207 (partim) ¹).

Criniger ruficrissus Sharpe, P. Z. S. 1879, p. 248; id. Cat. B. Br. Mus. VI, p. 81; id. Ibis 1889, p. 274; Everett, L. B. Born. p. 113.

Six specimens from Mount Liang Koeboeng, where they are found in high forest. — Iris blood red, bill horny blue, feet flesh-color.

This species is closely allied to *C. gutturalis*, from which it differs more strikingly than *C. sumatranus* especially in the following points: like in *C. sumatranus* the crown is olive-brown instead of rusty brown, the occipital crest more developed, the white feathers on chin and throat longer and purer white and the under tail-coverts darker brown. Moreover *C. ruficrissus* is somewhat larger and of a duller color above and below than both its above-mentioned congeners, being less lively olive-green but rather grayish

1) The specimen (N° 653), ranged by Salvadori with some doubts to *C. gutturalis*, though it is larger and darker above and below, undoubtedly belongs to the present species.

olive, the tail-feathers as well as the upper and lower tail-coverts are much browner than in the other two species.

Hab. Restricted to Borneo, where it is not so generally distributed as *C. gutturalis*, but rather an inhabitant of the hilly regions than of the plains and coast regions. It is a rather strange fact that two so closely allied species as *C. gutturalis* and *C. ruficrissus* were both found together at the same time in the forests of the Liang Koeboeng.

175. *Criniger Diardi*.

Trichophorus Diardi Temm. MS. Mus. Lugd.

Criniger Diardi Finsch, J. f. O. 1867, p. 18; Salvad. Ucc. Born. p. 208; Everett, L. B. Born. p. 113; Hose, Ibis 1893, p. 390.

A great number of specimens collected at the foot and on the slopes of Mount Kenepai, on the western slope of the Liang Koeboeng, at Nanga Raoen and in the Sibau valley; also from Long Bloe on the Upper Mahakkam. It is an inhabitant of low and high forest. — Iris brown, bill horny gray, feet yellow.

Males and females do not differ in size and color. Birds in transitional stage of plumage have the secondaries strongly margined with rufous. A nearly fledged nestling, obtained on Mount Liang Koeboeng, differs remarkably in having the upper surface, especially the secondaries and wing-coverts, russet brown instead of olive-green, the crown olive-brown instead of ashy gray, the throat yellow instead of pure white, the chest olive-green instead of ashy gray, and the rest of the lower surface pale sulphur-yellow. Although the plumage is quite downy, the long nuchal hairs are already strongly developed.

Hab. Restricted to Borneo, where it seems to be distributed over the whole island.

176. *Criniger Finschii*.

Criniger Finschii Salvad. Atti R. Acad. Torino VI, p. 128 (1871); id. Ucc. Born. p. 209; Sharpe, Cat. B. Br. Mus. VI, p. 84, pl. 6, fig. 1; Everett, L. B. Born. p. 113.

Seven specimens collected in the forests of Mount Liang Koeboeng and sixteen on the Upper Mahakkam. — Iris light brown, bill horny gray, feet brownish flesh-color. In some specimens the crown is conspicuously tinged with brown, but this variation seems to be independant from the sex. The male is constantly somewhat larger than the female.

Hab. Malayan Peninsula and Borneo, where it seems to be widely distributed.

177. *Iole olivacea*.

Iole olivacea Blyth, J. A. S. Beng. XIII, p. 386; Salvad. Ucc. Born. p. 210; Everett, L. B. Born. p. 111.

A large series from Mounts Kenepai and Liang Koeboeng, where it was found in high forest. Also from the Upper Mahakkam. — Iris white, bill horn-color, feet greenish yellow.

The immature bird has the upper surface, especially the wing, strongly tinged with ferruginous.

Hab. Malay Peninsula, Sumatra, Java and Borneo, where it seems to be spread over the whole island.

Timeliidae.

178. *Eupetes macrocerus*.

Eupetes macrocerus Temm. Pl. Col. II. pl. 516 (1836); Sharpe, Ibis 1890, p. 367; Hose, Ibis 1893, p. 388; Sharpe, Ibis 1894, pp. 421 and 542.

Two specimens (adult male and female) were shot near my station on the western slope of the Liang Koeboeng, at an altitude of 750 m., and an adult male on the Bruny River (Upper Mahakkam). — Iris dark brown, bill horny brown, naked skin on the neck blue, feet dark grayish blue.

It is by no means easy to see these birds, as they are running along the ground in high forest hidden by undergrowth and protected by their brown color which

is much that of the dead leaves amongst which they are scratching in search for insects and their larvae. As soon as such a bird finds itself observed, it will rest motionless on the same spot until it believes the danger to be over.

This species is known from Malacca, Sumatra and Borneo. From this latter island it was unknown until a few years ago, when it was found by Mr. Everett on Mt Penrisen, and by Mr. Hose on Mt Dulit, Mt Kalulong and Mt Mulu.

179. *Pomatorhinus borneensis*.

Pomatorhinus borneensis Cat. Mus. Hein. I, p. 84 (1850); Salvad. Ucc. Born. p. 210; Everett, L. B. Born. p. 104; Sharpe, Ibis 1889, p. 411.

A great number of specimens from Mounts Kenepai and Liang Koeboeng. Also from the Upper Mahakkam. — Iris pale yellow, bill horny white, culmen black on the basal three thirds, feet grayish blue, toes underneath ochre.

This exclusively Bornean species seems to be spread over the whole island, as it was already recorded from the South-east, the North-west and the North.

180. *Stachyris maculata*.

Timalia maculata Temm. Pl. Col. 593, f. 1 (1836); Salvad. Ucc. Born. p. 211.

Stachyris maculata Sharpe, Cat. B. Br. Mus. VII, p. 538; Everett, L. B. Born. p. 105; Sharpe, Ibis 1889, p. 414.

Numerous specimens from the Mounts Kenepai and Liang Koeboeng, and from the Sibau- and Siniai valleys, and four specimens from Long Bloe (Upper Mahakkam). A female specimen from the Siniai valley (at the eastern foot of the Liang Koeboeng) has hardly any black stripes on breast and belly, while a male from the same locality has the black shaft-stripes very strongly developed. — Iris from terra-cotta-yellow to yellowish white; eyelid and skin on face and throat sky-blue to purplish blue, and a stripe on both sides of the throat cobalt-blue; bill black, lower mandible pale blue, feet pale blue.

This rather quiet bird frequents low jungle and the undergrowth of high forest, where it feeds upon insects.

This species is known from Malacca, Sumatra and Borneo, where it seems to be spread over the whole island, having been recorded from Banjarmasin (Mottley) and Moeara Teweh on the Barito River, Sandakan Bay (Guillemard) and N. W. Borneo.

181. *Stachyris nigricollis*.

Timalia nigricollis Temm. Pl. Col. II, pl. 594, f. 2 (1836); Salvad. Ucc. Born. p. 212.

Stachyris nigricollis Sharpe, Cat. B. Br. Mus. VII, p. 535; Everett, L. B. Born. p. 104.

An immature male and an adult female with a nestling, all from Nauga Raoen, and ten specimens from the Bruny River (Upper Mahakkam). The younger bird differs from the adult in having the crown strongly tinged with rusty brown, a shade of which color is also to be seen on the abdomen and especially on the thighs; the white beard-spot is fully developed, while the white edging of the black gular spot is but faintly indicated. In the adult bird the white edging is formed by the lateral and hindmost black feathers of the throat having a rather broad and pure white subterminal band. The young bird seems to have no black on the throat, the extent of black in our immature bird being less than in the adult, and some of the lateral feathers being gray with a tendency of getting black, and showing a small central spot of white. — Iris in the adult bird red, in the immature one brown, bill in the adult bird black, lower mandible pale blue, while the latter is yellow in the younger bird, feet grayish blue.

The nestling has the entire head, neck and lower surface uniform sooty brown; back, wing and upper tail-coverts chestnut. The white spot at the angle of the bill is fully developed, as also the white spot behind the eye.

Hab. Malacca, Sumatra and Borneo. On the latter island

it seems to be generally distributed, as it is recorded from the South, the North-west, the North and the North-east.

182. *Stachyris poliocephala*.

Timalia poliocephala Temm. Pl. Col. II, pl. 593, f. 2 (1836); Salvad. Ucc. Born. p. 212.

Stachyris poliocephala Sharpe, Cat. B. Br. Mus. VII, p. 534; Everett, L. B. Born. p. 104; Sharpe, Ibis 1889, p. 414.

Two females from Mount Kenepai, two males from the Liang Koeboeng mountains and four males from the Upper Mahakkam. Living in brushwood and undergrowth of high forest. — Iris yellow, bill black, lower mandible horny blue, feet dirty green.

Hab. Malay Peninsula, Sumatra and Borneo (Kina Balu and Mount Kalulong).

183. *Stachyris leucotis*.

Timalia leucotis Strickl. Contr. Orn. 1848, p. 63, pl. 12.

Stachyris leucotis Sharpe, Ibis 1878, p. 418; id. Cat. B. Br. Mus. VII, p. 537; Everett, L. B. Born. p. 104.

Four adult specimens from Mounts Kenepai and Liang Koeboeng. Males and females are alike in color. — Iris black, bill black, base of lower mandible blue, feet brown.

Hab. Malacca and Borneo, where it was, hitherto, only obtained in Sarawak.

184. *Stachyris larvata*.

Timalia larvata Bp. Consp. I, p. 217 (1850); Sharpe, Cat. B. Br. Mus. VII, p. 534.

Stachyris borneensis Sharpe, Ibis 1887, p. 449; id. Ibis 1889, p. 413.

A series of ten specimens from Mt Kenepai and the Liang Koeboeng range, which are identical with one of Mr. Whitehead's specimens of *St. borneensis* from the Kina Balu. Comparing them with the types of *St. larvata* Bp. from Sumatra, I find that they cannot be separated from this latter species. It may be said that amongst our Bor-

near series there is some difference in the shade of the rufous-brown on the lower surface, some specimens being darker, other paler brown, but this difference appears to be quite individual, having nothing to deal with either sex, season or locality. Especially the darker specimens agree extremely well with the types from Sumatra. — Iris brick-red, in some specimens pale yellow, bill black, angle of mouth yellow in a young specimen, feet pale green, soles yellow. — Lives in brushwood and the undergrowth of high forest.

HAB. This species is known from Sumatra and Borneo, on which latter island it has hitherto been found in the North (Kina Balu) and in the mountainous parts of Sarawak.

185. *Staphidia Everetti*.

Staphidia everetti Sharpe, Ibis 1887, p. 447; id. id. 1889, p. 281; Everett, L. B. Born. p. 107.

Ten specimens collected in the forests of Mount Kenepai, at an average altitude of 500—600 m., while none were obtained in the plain at the foot of the mountain. All the specimens, probably freshly moulted, differ somewhat from the original description and also from one of Mr. Whitehead's specimens from Kina Balu which is at my disposal, in having the upper tail-coverts olive-gray like the back, instead of brown, while the central tail-feathers are broader and very dark brown or nearly black instead of earthy brown as shown by our Kina Balu specimen. — Iris brown, bill horny gray, feet flesh-color.

HAB. Restricted to Borneo, where it was discovered by Mr. Whitehead on the Kina Balu and afterwards found by other explorers on the mountains of Sarawak.

186. *Herpornis brunnescens*.

Herpornis brunnescens Sharpe, Ibis 1876, p. 41; id. id. 1879, p. 257; id. Cat. B. Br. Mus. VII, p. 637; Everett, L. B. Born. p. 107; Sharpe, Ibis 1889, p. 281; id. id. 1890, pp. 278, 290, 291; id. id. 1893, p. 550; id. id. 1894, p. 542.

Eight specimens from Mount Kenepai and the western slope of Mount Liang Koeboeng. Found in the undergrowth of primeval forest. — Iris dark brown, bill flesh-color, feet pale flesh-color.

Hab. Northern, Western and Central Borneo.

187. *Cyanoderma bicolor*.

Timalia bicolor Blyth, Ibis 1865, p. 46; Brüggem. Abh. Brem. V, p. 460.

Cyanoderma erythropterum Salvad. Ucc. Born. p. 213.

Mixornis bicolor Sharpe, Cat. B. Br. Mus. VII, p. 581.

Cyanoderma bicolor Sharpe, P. Z. S. 1875, p. 105; id. Ibis 1889, p. 280, et vol. seq.; Everett, L. B. Born. p. 105.

A great series collected at the foot and on the slopes of Mount Kenepai, at Nanga Raoen, in the Siniai valley, on the Liang Koeboeng, and numerous specimens collected at Long Bloe (Upper Mahakkam). — Iris dark brown, skin of face and chin underneath the feathers purplish blue, on the sides of the chin more cobalt; bill black, base of the lower mandible pale blue, feet grayish blue. — A fairly common species, especially at an altitude of about 500—800 m., living in jungle and the undergrowth of high forest.

Hab. Spread over the whole island of Borneo.

188. *Cyanoderma poliogaster*.

Stachyris poliogaster Hume, Str. Feath. IX, p. 116 (1880).

Stachyridopsis poliogaster Sharpe, Cat. B. Br. Mus. VII, p. 599.

Cyanoderma poliogaster Sharpe, N. L. M. 1884, p. 176.

A single specimen (♀) obtained on Mount Liang Koeboeng. — This bird fully agrees with the description of the typical specimen, which was hitherto the only one known to represent this species, and is therefore new to Borneo. — It is a true jungle-bird, and was shot in thick rattan-jungle, close to the ground. — Iris red, bill horny gray, lower mandible reddish at the base, feet greenish gray.

Hab. Johore (in the southernmost part of the Malay Peninsula) and Liang Koeboeng (Borneo).

189. *Micornis borneensis*.

Micornis borneensis Bp. Consp. I, p. 217 (1850); Salvad. Ucc. Born. p. 215; Everett, L. B. Born. p. 107; Sharpe, Ibis 1889, p. 416.

Ten specimens from Pontianak, Smitau, Nanga Raoen and Poelau, consequently all from the lowland of the Kapoeas basin, and five specimens from Long Bloe (Upper Mahakkam). — If there is any reason to separate this species from *M. javanica*, it can only be based upon the somewhat broader dark stripes on throat and breast, though it must be said that in some of the Bornean specimens of the Leyden Museum these stripes are not broader than in some Javan ones. — Iris pale orange, facial skin pale blue, bill black, lower mandible bluish horn-color, feet grayish green.

Hab. Borneo, where it seems to have a general distribution.

190. *Macronus ptilosus*.

Macronus ptilosus Jard. & Selby, Ill. Orn. pl. 150 (1835); Salvad. Ucc. Born. p. 216; Sharpe, Ibis 1889, p. 282; Everett, L. B. Born. p. 108.

Numerous specimens from the foot and the slope of Mount Kenepai, Nanga Raoen, the Liang Koeboeng, from Poelau on the Sibau River and from the Upper- and Lower Mahakkam. — Iris dark brown, skin above the eye sea-green, on chin and face purplish blue; bill black, lower mandible greenish, feet dark brown, soles ochre.

Hab. Malayan Peninsula, Sumatra and Borneo, where it is generally distributed.

Field-notes of Mr. von Berchtold: »Man trifft diese zutraulichen und wenig scheuen Vögel stets in dichtem Busch zu zweien oder in grösserer Gesellschaft, sich von Ast zu Ast, von Strauch zu Strauch herumtreibend und nach Nahrung suchend. Ihr ganzes munteres Benehmen ist so possierlich, dass es eine Freude ist, demselben zuzusehen. Ihr Hauptlockton ist ein leises »fih'' mit rasch hinter einander folgenden kurz ausgestossenes »kuku-kuku-

kuku". Ausser dem Hauptlockton stösst das Männchen zuweilen einen sehr eigenthümlichen, meckernden Ruf aus. Das Nest findet man unter der dichten Krone grossblättriger, aber niedriger Bäume im gemischten Wald. Dieses hat die Grösse eines Eichhörnchennestes und hat durch die zusammengefügtten und zusammengerollten Blätter Seiteneingänge zu der Mitte des Baues der eigentlichen Lagerstätte, worin der Vogel übernachtet. Ein solches Nest, das ich bei hereinbrechender Dunkelheit entdeckt habe und aus welchem fünf dieser Vögel flüchteten, fand ich am 15. Mai 1897 im Walde bei Lontopee am Koeteiflusse."

191. *Turdinus atrigularis*.

Myiothera atrigularis Temm. M. S. in Mus. Lugd.

Cacopitta atrigularis Bp. (ex Temm. M. S.) Consp. I, p. 257 (1850).

Turdinus atrigularis Blyth, Ibis 1870, p. 170; Salvad. Ucc. Born.

p. 217; Sharpe, Cat. B. Br. Mus. VII, p. 549; Everett, L. B. Born.

p. 109; Sharpe, Ibis 1889, p. 414; Büttik. N. L. M. 1895/6, p. 70.

Six specimens from the western slope of the Liang Koe-boeng and a female from the Upper Mahakkam. — A terrestrial bird, living in the undergrowth of high forest and feeding upon insects. — Iris brown, bill black, base of lower mandible horny whitish, feet brownish flesh-color.

Hab. Restricted to Borneo, where it seems to be spread over the whole island.

192. *Ptilopyga leucogrammica*.

Myiothera leucogrammica Temm. MS. in Mus. Lugd.

Cacopitta leucogrammica Bp. Consp. I, p. 257 (1850).

Turdinus leucogrammicus Salvad. Ucc. Born. p. 217.

Ptilopyga leucogrammica Everett, L. B. Born. p. 110; Büttik. N. L.

M. Vol. XVII, p. 72.

An adult male from the Bruny River (Upper Mahakkam). — Iris reddish brown, bill and feet horny brown.

Hab. Western and Central Borneo.

193. *Turdinulus exsul*.

Turdinulus exsul Sharpe, Ibis 1888, p. 479; id. id. 1889, p. 418;

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Everett, L. B. *Born.* p. 111; *Büttik. N. L. M.* 1895/6, p. 76.

Ten specimens from the western slope of the Liang Koeboeng, at an altitude of 800—1000 m. — This species has quite terrestrial habits, living in the thick undergrowth of the high forest.

For the color of naked parts see my full description of the bird, *N. L. M.* 1895/6, p. 77.

Hab. Borneo (elevations above 800 m.).

194. *Malacocincla Abbotti*.

Malacocincla Abbotti Blyth, *J. A. S. Beng.* XIV, p. 601 (1845); *Salvad.*

Ucc. Born. p. 230; *Büttik. N. L. M.* 1895/6, p. 79.

Myiothera concreta S. Müll. *MS. in Mus. Lugd.*

Myiothera Schwaneri Temm. *MS. in Mus. Lugd.*

Turdinus Abbotti Sharpe, *Cat. B. Br. Mus.* VII, p. 541; Everett, L. B. *Born.* p. 103.

An adult male collected near Poelau, on the Sibau River. Living quietly in brushwood near the ground. — Iris brownish red, bill horny gray, feet flesh-color. As to this species see the annotations in my above-cited note.

Hab. Indian Continent, Malay Peninsula and Borneo. On this latter island it has been found in the southern part on the Barito River (Müller, Schwaner, Mottley) and by myself on the Sibau River.

195. *Malacocincla rufiventris*.

Malacocincla rufiventris *Salvad. Ucc. Born.* p. 229 (1874); *Büttik. N. L. M.* 1895/6, p. 82.

Ptilopyga rufiventris Sharpe, *Cat. B. Br. Mus.* VII, p. 585; Everett, L. B. *Born.* p. 110; *Hose, Ibis* 1893, p. 338.

Turdinus tephrops Sharpe, *Bull. Br. Orn. Club*, N^o. 10, p. 54 (1893); *id. Ibis* 1893, p. 549.

A great number of specimens from the western slope of Mount Liang Koeboeng and one from the upper Sibau River. This bird is found along the ground in shrubs and high forest. — Iris brown, bill black, lower mandible horny whitish, feet brownish flesh-color.

H a b. Mountains of Sarawak and Central Borneo.
(See my remarks about this species in N. L. M. 1895, p. 82).

196. *Anuropteryx malaccensis*.

Myiothera poliogenys S. Müll. MS. in Mus. Lugd.

Brachypteryx malaccensis Hartl. Rev. Zool. 1844, p. 402; Salvad. Ucc.
Born. p. 222.

Brachypteryx poliogenis Strickl. Contr. Orn. 1849, p. 93, pl. 31.

Anuropteryx malaccensis Sharpe, Cat. B. Br. Mus. VII, p. 588; id. Ibis 1889,
p. 418; Everett, L. B. Born. p. 110; Büttik. N. L. M. 1895/6, p. 84.

Amauropteryx malaccensis Sharpe, Ibis 1894, p. 543.

Six specimens and a nestling collected on Mount Kenepai, six on Mount Liang Koeboeng, one near Poelau on the Sibau River and three specimens on the Upper Mahakkam. — Iris dark brown, bill black, lower mandible horny blue, feet flesh-color. The specimen from Poelau has the quills and tail-feathers broadly edged with rufous, which peculiarity is due to its immaturity.

In my above cited note I have already pointed to the difference in color, probably due to the different localities, of this species. Having no sufficient material, especially from the Malay Peninsula and Sumatra, at my disposal, I cannot tell about the specific value of these differences, but I may be allowed to observe that our two Sumatran specimens have their upper surface browner than all our Bornean birds. Strange enough, there is no difference in coloration amongst my 13 specimens from different localities, though both sexes are represented. All, except the above mentioned immature bird from Poelau, have the upper surface, with inclusion of the crown, olive, becoming more brown on rump and upper tail-coverts, while the tail-feathers are earthy brown and edged with rufous brown towards the base. From these the Sumatran specimens in the Leyden Museum differ in having the whole upper surface more ruddy brown and the tail-feathers entirely rufous. If all our Bornean specimens would be alike those mentioned above, they could be easily distinguished; there are,

however, two specimens from southern Borneo, belonging to the types of *Myiothera poliogenys* Müll. MS., and two specimens from Trusan (A. Everett) with the tail rufous like in our Sumatran specimens; they have, moreover, the crown strongly tinged with rufous, which is not the case with my specimens from the Kapoeas-region.

Our specimens, both from South and Central Borneo, are, moreover, much more richly tinged with orange rufous on the lower surface than those from Trusan and from Sumatra. The nestling agrees tolerably well with the adult bird in color, but has the back and quills reddish brown.

Hab. Malay Peninsula, Sumatra and Borneo, where the species seems to be spread over the whole island.

197. *Orthnocichla* ¹⁾ *Whiteheadi*.

Orthnocichla Whiteheadi Sharpe, Ibis 1888, p. 478 (Kina Balu); id. id. 1889, p. 410, pl. XII; Everett, L. B. Born. p. 111 (1889); Sharpe, Ibis 1894, pp. 421 (Mt Kalulong) and 543 (Mt Mulu).

Two females obtained on Mount Liang Koeboeng at an altitude of 900 m. — Iris dark brown, bill black, base of lower mandible whitish. — A very quiet bird, living in the undergrowth of the forest, where it is found hopping along the ground.

Hab. Northern, North-western and Central Borneo.

198. *Trichostoma rostratum*.

Trichostoma rostratum Blyth, Journ. As. Soc. Beng. XI, p. 795 (1842); Bp. Consp. I, p. 259; Sharpe, Cat. B. Br. Mus. VII, p. 562; Everett, L. B. Born. p. 10; Sharpe, Ibis 1889, p. 416; Büttik. N. L. M. 1895/6, p. 87.

Malacopteron rostratum Blas. Verh. z. b. Ges. Wien, XXXIII, p. 63.
Brachypteryx umbratilis Salvad. Ucc. Born. p. 220.

Adult male and female (Nos 1280 and 1223 of my collecting list), both from Nanga Raoen, and shot on May 13th 1894,

1) This genus, though in a strong degree showing affinities with *Anuropsis*, ought perhaps to be placed amongst the Wrens.

in the jungle of an abandoned plantation. — Iris reddish brown, bill black, lower mandible grayish horn-color, feet flesh-color.

Hab. Malay Peninsula, Sumatra and Borneo.

In my above-quoted revision of the genus *Turdinus* and allied genera, I have already called the attention upon the curious fact that the male (N^o 1280) has the tarsi abnormally short (18 mm. instead of 25), although this abnormality cannot be ascribed to rhachitis or any other obvious disease. This striking fact is plainly shown in the adjoined figures which my friend Dr. Finsch was kind enough to

Foot of *Trichostoma rostratum*.



draw for this purpose. The bird in question is in every other respect a true *T. rostratum*, though the shortness of the tarsi does not agree at all with the character of the genus, which latter is chiefly based upon the tarsus being half the length of the tail.

N. B. On his last journey on the Upper Mahakkam (November 1898 to March 1899), Dr. Nieuwenhuis obtained seven males and eight females, some of which were immature or still in down, but even the latter had the tarsus of normal length, i. e. 24—27 mm. A young bird, partly in down, has the upper surface, wing and the still very short tail of the same color as the adult bird, but the downy lower surface is dirty gray with a rufous tinge, and the base of the feathers white.

199. *Trichostoma canicapillum*.

Turdinus canicapillus Sharpe, Ibis 1887, p. 450 (Kina Balu); id. id. 1889, p. 415; id. id. 1890, p. 367 (Mt Penrisen), p. 433 (Mt Dulit), p. 547 (Mt Kalulong), p. 550 (Mt Poeh), p. 542 (Mt Mulu); Everett, L. B. Born. p. 108.

Trichostoma canicapillum Büttik. N. L. M. 1895/6, p. 89.

Three specimens from Mt Liang Koeboeng (800—900 m.). Frequenting the undergrowth of high forest. — Iris brown, bill horny gray, feet brown. — As I have pointed out in my above-cited paper, this species must be separated from the genus *Turdinus* and brought under *Trichostoma*.

Hab. Kina Balu, the mountains of Sarawak, and Central Borneo.

200. *Drymocapthus capistratooides*.

Myiothera capistratooides Temm. MS. in Mus. Lugd.

Drymocapthus capistratooides Strickl. Contr. Orn. 1851, p. 16; Salvad.

Ucc. Born. p. 218; Sharpe, Cat. B. Br. Mus. VII, p. 555; Everett,

L. B. Born. p. 109 (1889); Sharpe, Ibis 1889, p. 415; Büttik. N.

L. M. 1895/6, p. 91.

An adult male from Pontianak and another from the foot of Mount Kenepai, where it was found in brushwood, and five specimens from the Upper- and Lower Mahakkam. — Iris brown, bill black, below white, feet brown.

Hab. Borneo (spread over the whole island).

201. *Erythrocichla bicolor*.

Brachypteryx bicolor Less. Rev. Zool. 1839, p. 138.

Malacopteron ferruginosum Blyth, J. A. S. Beng. XIII, p. 383 (1844);

Salvad. Ucc. Born. p. 228.

Trichostoma bicolor, Blyth, Cat. B. Mus. As. Soc. p. 147 (1849); Bp.

Consp. I, p. 259 (ex Müll. MS. in Mus. Lugd.).

Napothera rubicauda Bp. Consp. I, p. 359.

Erythrocichla bicolor Sharpe, Cat. B. Br. Mus. VII, p. 551; id. Ibis

1889, p. 415; Everett, L. B. Born. p. 109; Büttik. N. L. M. 1895/6, p. 98.

Two adult males, from the foot of Mount Kenepai and from Nanga Raoen; also from the Upper Mahakkam. Obtained in brushwood near the ground. — Iris pale brown, bill brown, below horn-color, feet flesh-color.

Hab. Malay Peninsula, Sumatra and the whole island of Borneo.

202. *Trichicus pyrrhopygus*.

Trichizos pyrrhopygus Less. Rev. Zool. 1839, p. 167; Salvad. Ucc. Born. p. 224; Everett, L. B. Born. p. 99; Sharpe, Ibis 1889, p. 269.

An adult male and a female, both collected in March at an altitude of 800 m., in the high forest region on the western slope of the Liang Koeboeng Mountain. — Iris blood-red, bill black, feet flesh-color. — The female looks much like an immature bird, on account of the fulvous markings on front and the sides of head and neck, but in looking over the specimens in the Leyden Museum, I find that the four fulvous-throated birds, which all are marked females, show the same characteristics, so that this might be the really adult stage of the female of this species. On the other hand I have to state the fact that one of our gray-throated adult birds, collected by Schwaner, is marked »female” on the label.

This species, which frequents the undergrowth of the high forest and is often seen hopping along the ground, is found in Malacca (Wallace a. o.), in Sumatra (a specimen from Padang in Mus. Lugd., collected by S. Müller) and in Borneo. On this latter island it has been recorded from the North and from Sarawak, while the Leyden Museum contains specimens from Pontianak (Diard) and from the Barito River (Schwaner and S. Müller).

203. *Malacopteron magnum*.

Malacopteron magnum Eyton, P. Z. S. 1839, p. 103; Sharpe, Cat. B. Br. Mus. VII, p. 564; Everett, L. B. Born. p. 106; Büttik. N. L. M. 1895/6, p. 102.

Malacopteron majus Salvad. Ucc. Born. p. 225.

A large series, obtained at the foot of Mount Kenepai and in the Liang Koeboeng Mountain, 700—800 m., where it is a rather common bird, living in the high forest. Also from the Upper Mahakkam. The males are a trifle larger than the females, and have a longer bill. — Iris red, bill blackish, lower mandible horn-color, feet pale grayish blue, soles ochre.

Hab. Malay Peninsula, Sumatra and Borneo, where it is found in the South (Mocara Teweh), at the Sandakan Bay and in Sarawak.

204. *Malacopteron cinereum*.

Malacopteron cinereum Eyton, P. Z. S. 1839, p. 103; Sharpe, Cat. B. Br. Mus. VII, p. 565; id. Ibis 1889, p. 416; Everett, L. B. Born. p. 105; Büttik. N. L. M. 1895/6, p. 103.

Malacopteron magnum Salvad. Ucc. Born. p. 226.

A great series obtained at the foot of Mount Kenepai, at Nanga Raoen, in the Siniat Valley and on the western slope of the Liang Koeboeng, in which latter locality, at an altitude of about 700—800 m. above the sea, it is a very common bird, living in the undergrowth of the high forest. Also from the Upper Mahakkam. — Iris reddish brown, bill horn-color, base of lower mandible flesh-color, feet pale flesh-color.

Hab. Malacca, Sumatra and Borneo, where it is recorded from the North, the North-west (Sarawak) and the Centre of the island.

205. *Malacopteron affine*.

Trichastoma affine Blyth, J. A. S. Beng. XI, p. 795 (1842).

Napothera atricapilla Bp. Consp. I, p. 359 (Type in Mus. Lugd.).

Setaria affinis Salvad. Ucc. Born. p. 231.

Malacopteron affine Sharpe, Cat. B. Br. Mus. VII, p. 569; Everett, L. B. Born. p. 106; Sharpe, Ibis 1889, p. 416; Büttik. N. L. M. 1895/6, p. 105.

Nine specimens obtained at Pontianak, at the Southern foot of Mount Kenepai, at Nanga Raoen (Mandai Valley) and at Poelau (Sibau Valley). Twelve specimens from the Upper Mahakkam. — This species lives in low forest, feeding upon insects. Younger specimens differ from the adult in having the quills and wing-coverts broadly edged with rusty-red instead of olive-brown; a probably adult bird shows the peculiarity, already mentioned by Dr. Sharpe (l. c.), of having the throat striped with olive-brown, while,

as a rule, it ought to be uniform ashy white. — Iris red or reddish brown, bill horny gray, feet bluish gray.

Hab. Malay Peninsula, Sumatra and Borneo, where it seems to have a general distribution, as it is recorded from the South (by Grabowsky), from Laboean and from Sarawak. It seems to be a lowland species, but reaching up to 1000 feet on Mount Mulu (see Sharpe, *Ibis* 1894, p. 542).

206. *Malacopteron kalulongae*.

Turdinus kalulongae Sharpe, Bull. Br. Orn. Club, N° X, p. 54 (1893);
id. *Ibis* 1893, pp. 548 and 568; id. id. 1894, p. 542.

Malacopteron kalulongae Büttik. N. L. M. 1895, p. 106.

An adult male from Mount Kenepai and another from Mount Liang Koeboeng. Obtained in the undergrowth of the mountain-forest. — Iris gray, bill gray, lower mandible whitish, feet grayish blue.

Hab. The mountain-regions of Sarawak and Central Borneo. Dr. Sharpe recently separated this species from *M. magnirostre* on ground of its dark crown and the want of dusky streaks on the throat. I may not neglect to say, however, that only in the specimen from Mount Kenepai the throat is entirely unstriped, while in that from Mount Liang Koeboeng the longitudinal dusky streaks on the throat, so characteristic in *M. magnirostre*, are rather distinct, so that our species differs in fact from *M. magnirostre* only by the blackish crown. At the first glance one might be inclined to consider the specimen from Mount Liang Koeboeng as a valid different species on account of its striped throat, but the same peculiarity being found in the most closely allied *M. affine*, I consider it more reasonable to unite both birds under one and the same species. In fact there are amongst the great number of sooty brown-crowned *M. affine*, which I collected in Borneo, many specimens with the throat plain white, while in others the throat is more or less distinctly striped with gray. These stripes cannot be ascribed either to the sex of the

birds or to nonage, an immature specimen from Nanga Raoen showing no stripes at all.

The size of both my specimens of the present species is inferior to that mentioned by Sharpe in his Birds from Mount Kalulong, but having not seen that specimen myself, I dare not consider them as specifically distinct.

207. *Kenopia striata*.

Timalia striata Blyth, J. A. S. Beng. XI, p. 793 (1842).

Myiathra leucostigma S. Müll. MS. in Mus. Lugd.

Tardirostris leucostigma Bp. Cousp. I, p. 218.

Kenopia striata Salvad. Ucc. Born. p. 223, pl. V, fig. 2; Sharpe, Cat. B. Br. Mus. VII, p. 573; Everett, L. B. Born. p. 109; Sharpe, Ibis 1889, p. 416.

Three specimens from Mount Kenepai. A terrestrial bird, living in brushwood. — Iris grayish brown, bill black, feet pale flesh-color. — A nearly fledged nestling only differs from the adult birds in having the clear shaft-stripes on the crown more rufous than white and the crown itself dark olive-brown instead of black, and the rusty white patch in front of the eye is wanting, this part being of the same color as the crown.

Hab. Malacca and Borneo, where it is spread over the North-east, the North, the North-west and the Centre of the island.

208. *Rhinomyias pectoralis*.

Alcippe pectoralis Salvad. Atti R. Ac. Sc. Tor. 1868, p. 530.

Setaria pectoralis Salvad. Ucc. Born. p. 233, pl. IV, fig. 1.

Rhinomyias pectoralis Sharpe, Cat. B. Br. Mus. IV, p. 368; id. Ibis 1889, p. 201.

Four specimens from the Liang Koeboeng and two from the Upper Mahakkam. — Iris brown, bill black, feet bluish white.

Hab. This species seems to be spread over whole Borneo, as it is recorded from the most different localities. In the Leyden Museum are some specimens collected by Schwaner on the Barito River and at Pontianak. Besides from Borneo

this species is hitherto only known from Sumatra, where it was collected by S. Müller.

209. *Rhinomyias ruficrissa*.

Rhinomyias ruficrissa Sharpe, Ibis 1887, p. 441; id. id. 1889, p. 200; Everett, L. B. Born. p. 131; Sharpe, Ibis 1892, p. 435.

An adult male from the western slope of the Liang Koeboeng. — Iris dark brown, bill black, feet whitish blue.

Hab. Borneo, where it seems to be restricted to the mountain-regions. Hitherto known from Mount Kina Balu, Mount Dulit, Mount Kalulong, Mount Penrisen and Mount Liang Koeboeng.

210. *Alcippe cinerea*.

Alcippe cinerea Blyth, J. As. Soc. Beng. XIII, p. 384 (1844); Sharpe, Cat. B. Br. Mus. VII, p. 622; id. N. L. M. 1884, p. 178 (partim) 1); id. Ibis 1889, p. 283; Everett, L. B. Born. p. 106.

Alcippe pyrrhoptera (partim) Salvad. Ucc. Born. p. 234.

A great number of specimens from the Mounts Kenepai and Liang Koeboeng, where it is a regular forest-bird, feeding upon insects. — Iris gray, bill horny gray, feet gray.

Hab. Malacca, Sumatra (Leyd. Mus.) and Borneo, where it is recorded from the South (Schwaner, Leyd. Mus.), from Sandakan, Kina Balu and the mountain-regions of Sarawak.

Pittidae.

211. *Pitta cyanoptera*.

Pitta cyanoptera Temm. Pl. Col. 218 (1823); Schleg. Vog. Ned. Ind.

Pitta, pp. 9 and 32, pl. 4, fig. 1; Salvad. Ucc. Born. p. 235; Everett, L. B. Born. p. 147; Sharpe, Ibis 1889, p. 442.

1) In this paper Sharpe identified the specimens of *Napothera phaionota* Kuhl MS. from Java in the Leyden Museum with *Alcippe cinerea* Blyth. This opinion is decidedly wrong, as *N. phaionota* undoubtedly belongs to *Alcippe pyrrhoptera*, of which the Leyden Museum possesses a great number of specimens from Java and Sumatra. Salvadori (l. c.) mentions *Alcippe pyrrhoptera*, but I feel sure that a re-examination of his specimens from Borneo, if really obtained on that island, will prove that they belong to *A. cinerea*.

An adult female, obtained in the mountain-forests of the Liang Koeboeng range, and a male and three females, all similar in color, from the Upper Mahakkam. — Iris hazel, bill dark brown, feet pinkish flesh-color.

Hab. The whole south-eastern corner of Asia, Sumatra (Mus. Lugd.) and Borneo.

212. *Pitta Mülleri*.

Pitta atricapilla (partim) Temm. Pl. Col. II, Genre *Pitta*, Esp. 6 (1830); (partim) Müll. & Schl. Verh. Zool. Aves, pp. 9 and 19; Schleg. Vog. Ned. Ind. *Pitta*, pp. 6 and 31, pl. 2, figs. 2 and 3. *Pitta Mülleri* Bp. Consp. I, p. 256 (1850); Salvad. Ucc. Born. p. 240; Everett, L. B. Born. p. 149; Sharpe, Ibis 1889, p. 443; Whitehead, Ibis 1893, p. 499.

Three specimens from Sanggau, Nanga Raoen, Poetoes Sibau, Poelau, also from the Upper Mahakkam. — Iris dark brown, bill black, feet grayish brown.

Hab. Sumatra, Banka, Java (Coll. Vorderman in Mus. Lugd.) and Borneo.

Field-notes of Mr. von Berchtold: »Dieser scheue Vogel scheint nur dichtes Ufergebüsch, durchmischt mit hoher Grasvegetation, namentlich aber die dichten Bestände der *Elettaria speciosa* zu lieben. Indessen kann man seine Anwesenheit fast immer constatiren, da er mit Ausnahme der heissen Mittagszeit beinahe den ganzen Tag ein in kurzen Zwischenräumen wiederholtes »fib, fib'' hören lässt''. — Ich habe im Buschwald von Poelau bei diesem Vogel einen hübschen Gesang beobachtet (Büttik.).

213. *Pitta coerulea*.

Myiothera coerulea Raffl. Trans. Linn. Soc. XIII, p. 301 (1822).
Pitta coerulea Everett, L. B. Born. p. 147.

One specimen from the Upper Mahakkam. — Iris brown, bill and legs brown.

Hab. Malay Peninsula, Sumatra and Borneo.

214. *Pitta arcuata*.

Pitta arcuata Gould, Ann. and Mag. Nat. Hist. ser. 4, VII, p. 340 (1871).

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Pitta arcuata Salvad. Ucc. Born. p. 241; Everett, L. B. Born. p. 148
Sharpe, Ibis 1889, p. 441.

An adult male from Mount Kenepai and three females from Long Bloe (Upper Mahakkam). — Iris grayish blue, bill black, feet purplish blue.

Hab. Borneo generally.

215. *Pitta granatina*.

Pitta granatina Temm. Pl. Col. 506 (1830); Schleg. Vog. Ned. Ind. *Pitta*, pp. 20 and 35, pl. 5, fig. 3; Salvad. Ucc. Born. p. 242; Everett, L. B. Born. p. 148; Whitehead, Ibis 1893, p. 502.

Two adult females from Nanga Raoen, and an adult male from Poelau. — Iris dark grayish brown, bill black, feet purplish blue.

Hab. Lowlands of Borneo, where it seems to be generally distributed.

216. *Pitta Baudi*.

Pitta Baudi Müll. & Schl. Verh. Zool. *Pitta*, pp. 10, 15 and 20, pl. II (1839—44); Salvad. Ucc. Born. p. 243; Selat. Cat. B. Br. M. XIV, p. 444; Everett, L. B. Born. p. 149; Sharpe, Ibis 1889, p. 441.

Adult male and female (Dr. Nieuwenhuis, 1899).

Hab. Borneo.

217. *Pitta Schwaneri*.

Pitta Schwaneri Bp. Consp. I, p. 256 (1850); Schleg. Vog. Ned. Ind. *Pitta*, pl. 6, fig. 4; Salvad. Ucc. Born. p. 243; Everett, L. B. Born. p. 149; Sharpe, Ibis 1889, p. 442.

Eucichla Schwaneri Whitehead, Ibis 1893, p. 508.

Six specimens from the mountain-forests of the Liang Koeboeng range. — Iris dark brown, bill black, feet purplish gray.

Hab. Mountain-regions of Borneo.

Sylviidae.

218. *Phylloscopus borealis*.

Phyllopneuste borealis Blasius, Naumannia 1858, p. 313.

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Phylloperneuste javanica et *magnirostris* Salvad. Ucc. Born. p. 244.

Phylloscopus borealis Everett, L. B. Born. p. 96.

A number of specimens obtained at Smitau, Mounts Kenepai and Liang Koeboeng between December 8th and April 27th, in low jungle. Also 12 specimens obtained by Dr. Nieuwenhuis on the Upper Mahakkam (Oct. 24th to Dec. 23rd 1898). Most of these latter have the feathers much abraded and the white tips on the wing-coverts in most of the specimens wanting. There is no difference to be observed in the obtained specimens with regard to the date at which they were shot, but two of them, both shot at Smitau, probably younger birds, are greener above and tinged with yellow on the superciliary streak and on the throat and breast, while in one of them the greater wing-coverts are moreover tipped with white. — Iris black, bill brown, lower mandible flesh-color at the base, feet flesh-color.

This species breeds in the North of Eastern Asia and is only a winter visitor in Borneo, where it is recorded from North-west and North Borneo (Beccari, Everett, Ussher, Whitehead), and from Pontianak (Mus. Lugd.).

219. *Phylloscopus xanthodryas*.

Phylloscopus xanthodryas Swinhoe, P. Z. S. 1863, p. 42; Everett, L.

B. Born. p. 97; Sharpe, Ibis 1889, p. 265.

A single specimen obtained on January 31st on Mount Kenepai. — Upper surface lively olive-green, lower surface and superciliary streak and under wing-coverts lemon-yellow. — Iris black, culmen dark brown, rest of bill whitish, feet yellowish gray, tarsi brown.

This species breeds in North-eastern Asia and is, as it seems, rarely found as a winter visitor in Borneo. Laboean, N. E. Borneo (Low, Treacher), Kina Balu (Whitehead).

220. *Orthotomus ruficeps*.

Orthotomus ruficeps Less. Traité d'Orn. p. 309 (1831); Salvad. Ucc.

Born. p. 248; Sharpe, Ibis 1889, p. 279; Everett, L. B. Born. p. 101.

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An adult male, from Pontianak, an adult male and female, both similar in color, obtained in May at Nanga Raoen, an immature male with red tail but the red on the head not yet fully developed from Smitau (Dec. 9th) and a young male from Poelau, Sibau R. (April 15th). Four specimens from the Upper Mahakkam. The specimen from Poelau has, in strong contrast to the adult birds, the upper surface olive-green and the white lower surface, and especially the sides of head and neck, very strongly washed with yellow. A few red feathers are making their appearance on the olive-green crown, while on the tail the red color is more strongly developed. — The iris in the adult birds is brick-red, the upper mandible brown, the lower whitish, feet pale flesh-color; in the young bird the iris is gray, the lower mandible yellow.

This species is found round the native settlements, very often together with the following species. In the jungle and high forest it was never observed.

Hab. The Indo-Malayan region, Java excepted, and the Philippines. In Borneo it seems to be a rather common bird over the whole island.

221. *Orthotomus atrigularis*.

Orthotomus atrigularis Temm. Pl. Col. III, text in livr. 101 (1836);
Salvad. Ucc. Born. p. 249; Sharpe, Cat. B. Br. M. VII, p. 220;
Everett, L. B. Born. p. 102.

An adult male (Dr. Nieuwenhuis, 1899), exactly alike other specimens from Borneo and Billiton (Dr. Vorderman).

Hab. From Burmah through the Malay Peninsula to Sumatra, Billiton and Borneo.

222. *Orthotomus cineraceus*.

Orthotomus cineraceus Blyth, Journ. A. S. Bengal. XIV, p. 589 (1845);
Sharpe, Ibis 1889, p. 279; Everett, L. B. Born. p. 102.
Orthotomus borneoensis Salvad. Ucc. Born. p. 248; Sharpe, Ibis 1876,
p. 41, pl. II.

A fine series of both sexes from Smitau, Nanga Raoen,

Mt Liang Koeboeng (780 m.) and Poelau. Five specimens were also obtained by Dr. Nieuwenhuis in the winter 1898—99 on the Upper Mahakkam. — Iris brownish orange, bill flesh-color, culmen dark brown, feet pale flesh-color.

This species has a rather wide distribution, as it is recorded from Malacca, Sumatra and Billiton, and seems to be spread over the whole island of Borneo. From Java it is not mentioned in literature, but the Leyden Museum contains three specimens bearing »Java” on their labels. It is a rather curious fact that a specimen was killed as high up as my station on the slope of the Liang Koeboeng, the nearest human habitations being far off from this place at the bottom of the valley.

223. *Burnesia superciliaris*.

Prinia superciliaris Salvad. Ucc. Born. p. 249 (1874).

Burnesia superciliaris Sharpe, Cat. B. Br. Mus. VII, p. 206; id. Ibis 1889, p. 278; Everett, L. B. Born. p. 102.

A small number of adult and immature birds from Smitau, Nanga Raoen, Poetoes Sibau, Poelau and the Upper Mahakkam. — Iris brown, bill black (in young specimens yellow), feet and claws flesh-color, in some specimens wax-yellow. — It frequents the vicinities of settlements, where it is found in low brushwood and alang-alang fields.

Hab. This species is restricted to Borneo, where it seems to be spread over the whole island.

224. *Acrocephalus orientalis*.

Salicaria turdoides orientalis Temm. & Schl. Faun. Jap. Aves, p. 50, pl. XX B (1847).

Acrocephalus orientalis Salvad. Ucc. Born. p. 251; Everett, L. B. Born. p. 97; Sharpe, Ibis 1889, p. 266.

A bird of the year, with dark shaft-streaks on the throat, obtained May 12th at Nanga Raoen. — Iris grayish brown, bill brown, lower mandible flesh-color, feet dark grayish brown.

This eastern form of our *A. turdoides* breeds in Eastern

Asia and passes the winter-months in Southern Asia and the Malay Archipelago; in Borneo it is recorded from the North-East (Beccari, Everett, Ussher, Low, Treacher, Whitehead), Borneo (Mus. Lugd.).

Saxicolidae.

225. *Cittocinclu suavis*.

Copsychus suavis Scat. P. Z. S. 1861, p. 185.

Cittocinclu suavis Salvad. Ucc. Born. 252; Everett, L. B. Born. p. 100.

Two adult males and a female, all collected at Nanga Raoen, where we found it in low forest, and three specimens from Poetoes Sibau, the Upper- and the Lower Mahakkam, collected by Dr. Nieuwenhuis. The specimen from the Lower Mahakkam is immature, showing some remnants of the brown-spotted dress of the young bird, especially on neck and upper wing-coverts. — Iris coffee-brown, bill glossy black, feet purplish white.

The male N° 1254 and the female N° 1255 (matched) were shot near their nest (N° 1248^a) on May 15th in an old, deserted plantation. The nest was placed in a hollow tree ten feet above the ground, and consists of a coating of dead leaves lined with rootlets, small feathers and the abdominal scales of a snake. It contained two eggs of a bluish green color, very thickly speckled all over with reddish brown. Size of the eggs 2,3 + 1,8 cm. As both eggs were already fairly set, it is very probable that two is the regular number of the clutch in this species.

This exclusively Bornean species is known from the southeastern, southern, western, north-western and central parts of the island. In the North it is represented by the white-crowned *C. Stricklandi* Motley & Dillwyn.

»Ein äusserst gewandter, munterer, doch sehr scheuer Vogel. In stets aufgerichteter Stellung, doch unruhig, sieht er sich immerwährend nach allen Seiten um, und mit stark ausgebreiteten Schwung- und Schwanzfedern, etwas bogenförmig gehaltenen und stark bewegten Flügeln und wip-

pendem Schwanze, lässt er seinen schönen, kräftigen Gesang, ausgenommen in der Mittagszeit, den ganzen Tag mit grösseren und kleineren Zwischenräumen im dichten Busch ertönen. Dieser Gesang besteht anfangs aus leisen piependen, dann trillernden mannigfaltigen, schliesslich starken und schwachen, sonderbar abwechselnden, steigenden und fallenden Tönen. Derselbe wird aber noch schöner und angenehmer, indem er zuweilen durch die Nachahmung des Gesanges anderer Vögel vermannigfaltigt wird. Er ist unstreitig der beste Sänger von Borneo und erinnert dem Gesange nach an unsern europäischen Rohrsänger. Durch nachgeahmten Schlag wird man oft den Vogel augenblicklich herbeilocken. Mit aufgebauschtem Gefieder und scheinbar kampfbereit erscheint der gestörte Sänger, um wahrscheinlich seinen Nebenbuhler aus dem Reviere zu vertreiben. Doch kaum hat er den Beobachter bemerkt, so ist der Vogel schon wieder verschwunden. Er sitzt dann irgendwo in der Nähe, still doch gut geborgen, und erwartet das neue Gepfeife. Dann aber beginnt er zu trillern und zu schlagen mit solch mannigfaltigen Variationen, dass es ein wahrer Genuss wird, diesem Gesange zuzuhören. Der Vogel wechselt den Standplatz jeden Augenblick, verlässt aber den Beobachter nicht, sobald dieser zeitweise irgend etwas vorpfeift. Ich hatte die Freude, einen dieser Vögel das Militärsignal »Vorwärts" in circa 40 Minuten gelehrt zu haben. Des anderen Tages hörte ich in derselben Gegend den Vogel die neu erlernte Melodie, doch mit einigen schönen Variationen, pfeifen. Ich ahmte den Lockruf »fi, fi, fi", nach und pfiß darauf das Militärsignal, worauf der Vogel sofort erschien und der Unterricht von Neuem begann.

Die Kayan-Dajaks in Mendalam (oberer Kapuas) zollen diesem Vogel eine ganz besondere Verehrung. Sie betrachten ihn als den Ueberbringer der Botschaften guter Geister. Soll eine Reise angetreten werden, so befragen die Dajaks zuerst die guten Geister, wann sie dieselbe antreten sollen, um unterwegs auf kein Unglück zu stossen, indem sie den Aufflug des Vogels beobachten. Fliegt derselbe nach rechts,

so betrachten die Dajaks als ein günstiges Zeichen von seiten der Geister. Es wird nun diesen zu Ehren ein kleines Feuer angemacht und in einem Bambusrohr etwas Reis gekocht. Ist der Reis gar, so nimmt jeder der sich an der Reise betheiligen will, eine Fingerspitze voll Reis zu sich, worauf der Marsch unverzüglich angetreten wird in der festen Ueberzeugung, dass während der Reise kein Unglück geschehen wird." (v. Berchtold).

226. *Copsychus musicus*.

Lanius musicus Raffl. Trans. Linn. Soc. XIII, p. 307 (1822).

Copsychus mindanensis Salvad. Ucc. Born. p. 254.

Copsychus musicus Sharpe, Cat. Birds Br. Mus. VII, p. 63; Everett, L. B. Born. p. 99; Sharpe, Ibis 1893, p. 384.

A fine series of adult and young birds of both sexes was collected at Pontianak, Smitau (Kapoeas R.), Nanga Raoen (Mandai R.), Poelau (Sibau R.) and on the Upper Mahakkam. — Iris dark brown, bill and feet black.

This is the only species of *Copsychus* I met with in Borneo. Along the Kapoeas and its tributaries it is a common bird in and round the native campougs, and we found it also very often in old ladangs (plantations) far off from any human habitation, and, when the water was getting low, on the exposed mud- and sandbanks along the rivers, searching for worms and insects. It is a very lively bird and an excellent singer. Its breeding time is about April, but as I was collecting that time in the Liang Koeboeng Mountains, where it is not found, I had no chance to procure its nest and eggs.

This species is spread over the whole Indo-Malayan region, being known from Siam and Malacca, Sumatra, Banka, Billiton, West-Java and Borneo. On this latter island it seems to be less generally distributed than its black-bellied congener *C. amoenus*, as it was hitherto only recorded from Sarawak (Salvadori, Everett). As to the distribution of the present species on the island of Java, a series of 26 specimens contained in the collection of Mr. Vorderman shows

that it is exclusively restricted to Western Java as far as Cheribon, while *C. amoenus* is represented in the same collection by 22 specimens, all without exception from Eastern Java.

227. *Copsychus amoenus*.

Turdus amoenus Horsf. Trans. Linn. Soc. XIII, p. 147 (1822).

Copsychus amoenus Salvad. Ucc. Born. p. 255; Sharpe, Ibis 1889, p. 270; Everett, L. B. Born. p. 99.

Copsychus saularis (part.) Sharpe, Cat. B. Br. Mus. VII, p. 61.

A nearly adult male, still showing some gray feathers on breast and abdomen, and an adult female, both from the Upper Mahakkam (Nieuwenhuis). — Iris, bill and feet black. — Contents of stomach: insects.

Hab. East-Java¹⁾, Bali and Borneo, with the exception of Sarawak and the Kapuas-region.

Turdidae.

228. *Myiophoneus borneensis*.

Myiophoneus borneensis Slater, Ibis 1885, p. 123; Sharpe, Ibis 1887, p. 444; id. id. 1889, p. 269; Everett, L. B. Born. p. 98; Ch. Hose, Ibis 1893, p. 383; Sharpe, Ibis 1893, p. 550; id. id. 1894, p. 542.

A matched pair of this species (Nos 986 and 1091), belonging to the nest and eggs described below, were obtained near my station »Poenan-Grot'', on the western slope of the Liang Koeboeng Mountain, on April 14th and 23^d (the female caught on the nest) and a second female, also adult, in the same locality.

As Dr. Sharpe already pointed out (Ibis 1887, p. 444), the first description of this species, by Mr. Slater, is made after an immature bird with the white drops on the lower surface, which reminds much the corresponding parts in our European Nutcracker. Dr. Sharpe considers the present species to be nearly allied with *M. Blighi* from Ceylon, but

1) See the distribution of the previous species.

it is wanting the blue shade of the latter on back and breast. As the learned author does not mention any further details about the plumage of the adult birds, it may be useful to give here a plain description.

Adult male: General color sooty black, somewhat darker on the fore-parts above and below; these darker parts are, especially when viewed under a certain light, more or less strongly glossed with purplish blue, the hind margin of each feather being of that color; lesser wing-coverts glossy purplish blue, rest of the wing throughout sooty brown, outer under wing-coverts white at their larger basal half, thus forming a small white area which is preceded by some purple-shaded feathers. Feathers on back, rump, flanks, breast and abdomen pure white over nearly their basal half, this color decreasing in extent on mantle and chest, where it is reduced to mere white shaft-streaks, while it is entirely wanting on head, neck, throat, upper- and under tail-coverts and on the thighs. — Iris dark brown, bill and feet black. Wing 14,4 cm.; tail 8,2; tarsus 4,5; culmen 3,3.

Adult female: Similar to the adult male, but somewhat lighter and showing, over nearly the whole plumage, a hue of olive-brown when seen under a certain light; the purplish gloss is less obvious than in the male, the purplish blue shoulder-spot, however, hardly less strongly developed. It is also somewhat smaller than the male. The second female seems to be somewhat younger, being lighter brown and larger, its wings surpassing in length those of the adult female.

A young male, to judge from its spotted plumage, is still browner and differs, moreover, from the adult birds in having drop-like white shaft-streaks on the sides of head and neck, on throat, chest, breast and abdomen and even on the under tail-coverts, the drop-like shape of these streaks being strongly visible on chest and breast, reminding our European Nutcracker. The under wing-coverts and the edge of the wing are almost entirely white. This specimen,

collected by Schwaner in South Borneo and registered as a young male of *M. cyaneus* (Horsf.) is a little larger than the adult male.

This species was found near my above-mentioned station (784 m. above the level of the sea), at the foot of the high rocks which bear the top-plateau of the mountain and over which are dashing down a great number of waterfalls. Along the small rivulets fed by the waterfalls and running through the high forest which covers the slope of the mountain, the birds were found running up and down the rocky banks or frequenting the thick underwood, uttering some soft, melodious notes and scratching the ground and turning over dead leaves and other decaying matter in search for insects and small molluscs. In a narrow hole of the perpendicular rock near the station, about five feet from the ground, we found a nest of this species, and having shot the male, we a few days afterwards took the female, which had not stopped breeding, with nest and eggs during night-time. The nest forms a rather thick and solid construction of moss, and the cup is neatly lined with black rootlets and a few dead leaves, no mud being used in the whole nest. The length of the rather deep cup is 10, the width 8 cm., while the diameter of the whole nest is about 17. Directly behind this nest and even connected with it we found two empty and probably old ones of the same size and construction. The hole being rather narrow and deep, I only succeeded in getting the two foremost, which are now, together with the eggs, in the Leyden Museum.

The two eggs — I had in vain waited for more before capturing the female — are rather long, slender and conical, their color is white with numerous minute pale reddish punctulations, which are rather more concentrated round the thicker pole. Longer axis 4 cm., shorter 2,2.

From the fact that the two eggs already contained fairly developed young birds, and that during a weeks waiting no new eggs were laid, considering further that Charles

Hose found a nest of this species with two young birds only, we may fairly conclude that this is the full number of the eggs of a clutch.

Another (empty) nest belonging to this species, and of the same construction, I found very near the top-platform of the mountain, at an elevation of 1100 m., on a projecting boulder of a hugh rock, being protected from the rain by an overhanging part of the rock just above it.

From all we know from the few collectors who hitherto chanced to meet with this species, it must be considered a highland form, living along small mountain-streams in rocky territory. Mr. Whitehead is the first to tell us about its nesting in crevices of rocks (Ibis 1889, p. 269), while Mr. Hose found his above-mentioned nest placed on a tree-stump.

This species is, up to this date, known from North and North-west Borneo and the Liang Koeboeng. The above mentioned young bird from Southern Borneo in the Leyden Museum is hardly collected at Banjarmasin as is mentioned on the label, but is most likely collected in the mountain-region during Schwaner's journey across the island from the mentioned place to Pontianak in West Borneo.

229. *Erithacus cyaneus*.

Motacilla cyanea Pallas, Reise Russ. Reichs, III, p. 697 (1766).

Erithacus cyaneus Everett, L. B. Born. p. 98; Sharpe, Ibis 1889, p. 268.

Erithacus cyaneus Hose, Ibis 1893, p. 383.

A small number of this species obtained on Mount Kenepai (550 m.) in January, and on the Liang Koeboeng (800 m.), March and April 2^d. This very nice little bird is found in high forest as well as in low jungle, very quickly running along the ground in search for insects, especially white ants and their larvae.

This species breeds in Eastern Siberia and passes the winter months in more southern districts of the continent and in Borneo. On this island it is recorded from Labuan (Low), Kina Balu (Whitehead) and Baram District (Hose).

Motacillidae.230. *Henicurus borneensis*.

Henicurus borneensis Sharpe, Ibis 1889, p. 277; Everett, L. B. Born. p. 100.

A small number of this species were collected on the western slope of the Liang Koeboeng, near my station »Poenan-grot'', at an altitude of 700—800 meter, and another at a less considerable height on the Liang Gagang (800 m.) south of Nanga Raoen. — Iris dark brown, bill black, feet (claws included) rosy white.

This Bornean representative of the genus *Henicurus* stands between the very closely allied *H. Leschenaulti* (Vieill.) from Java and *H. sinensis* Gould from China. From the first it differs by the shorter and posteriorly rounded white crown-patch, and from the latter by the narrower tail-feathers which are broadly tipped with white like in *H. Leschenaulti*, while in *H. sinensis* they show a rather narrow, oblique terminal bar. Curiously enough the reddish wash on upper and under tail-coverts, recorded by Dr. Sharpe in his diagnosis of the Bornean species, is entirely wanting in all my above-mentioned specimens, these parts being pure white.

A young female (nearly full-grown) has the top of the head uniformly colored with the back; chin and upper throat are white with a slight fulvous tinge, while chest and breast are sooty brown with white shaft-streaks.

As to the habits of this bird I have nothing to add to what is told by Mr. Charles Hose (Ibis 1889, p. 277).

Hab. Central, North-Western and Northern Borneo.

231. *Hydrocichla frontalis*.

Enicurus frontalis Blyth, Journ. As. Soc. Beng. XVI, p. 156 (1847).

Henicurus frontalis Salvad. Ucc. Born. p. 258.

Hydrocichla frontalis Sharpe, Ibis 1889, p. 278; Everett, L. B. Born. p. 100.

An adult female from Long Bloe, Upper Mahakkam. —

Iris brown, bill black, feet white. — Contents of stomach: insects.

Hab. Malay Peninsula and Borneo.

»Hält sich nur an den Quellbächen des Gebirgslandes auf und scheint das Flachland ganz zu meiden.“ (v. Berchtold).

232. *Hydrocichla ruficapilla*.

Enicurus ruficapillus Temm. Pl. Col. III, 534 (1832).

Hydrocichla ruficapilla Sharpe, Cat. B. Br. Mus. VII, p. 319; Everett, L. B. Born. p. 101.

Numerous specimens, amongst which a nestling (November 13th), from the Upper Mahakkam. — Iris brown, bill black, feet and claws white. — Contents of stomach: insects.

Hab. Malay Peninsula and Borneo.

»Im Gebiete des Kapoeas nie gesehen, doch im Gebiete des oberen Mahakkam kommt die Art überall vor. Sie hält sich mit Vorliebe an Waldbächen auf“ (von Berchtold).

233. *Motacilla flava*.

Motacilla flava L. Syst. Nat. I, p. 331 (1760); Everett, L. B. Born. p. 102; Sharpe, Ibis 1889, p. 431.

Budytes viridis Salvad. Ucc. Born. p. 260.

Budytes cinereicapillus Salvad. Ucc. Born. p. 261.

Three specimens collected by Mr. Moret at Pontianak.

Hab. A usual winter-guest in the lowlands of Borneo.

234. *Motacilla melanope*.

Motacilla melanope Pall. Reise Russ. Reichs, III, App. p. 696 (1776); Sharpe, Cat. B. Br. Mus. X, p. 497; Everett, L. B. Born. p. 103; Sharpe, Ibis 1889, p. 430.

Calobates bistrigata Salvad. Ucc. Born. p. 259.

A male and four females (Dr. Nieuwenhuis, October 1898 to January 1899).

Hab. From Europe and Northern Asia through India to the Sunda Islands, where it passes the winter-months.

Ploceidae.235. *Munia fuscans*.

Spermestes fuscans Cass. Proc. Phil. Acad. VI, p. 185 (1852).

Munia fuscans Scat. P. Z. S. 1863, p. 219; Salvad. Ucc. Born. p. 268; Everett, L. B. Born. p. 142; Sharpe, Ibis 1889, p. 434.

Numerous specimens from Smitau, Mount Kenepai, Nanga Raoen and Poetoes Sibau, where it is a common bird in the »ladangs" of the natives. A male and a female from the Upper Mahakkam. — Iris and bill black, feet grayish blue.

Hab. Lowlands of Borneo.

236. *Munia brunneiceps*.

Munia brunneiceps Walden, Trans. Z. S. VIII, p. 73, pl. IX, fig. 1 (1872); Everett, L. B. Born. p. 142; Sharpe, Ibis 1889, p. 434.

Munia atricapilla Salvad. Ucc. Born. p. 265.

Four specimens from Pontianak and Smitau, and five specimens from the Upper Mahakkam. A common bird in the vicinity of human habitations and native rice-farms. — Iris black, bill grayish blue, feet black.

Hab. Borneo and Celebes (probably introduced in the latter island).

Sturnidae.237. *Calornis chalybea*.

Turdus chalybeus Horsf. Trans. Linn. Soc. XIII, p. 148 (1822).

Calornis chalybea Salvad. Ucc. Born. p. 91; Everett, L. B. Born. p. 142; Sharpe, Ibis 1889, p. 432.

Four specimens from Pontianak. — Iris red, bill and feet black.

Hab. Malay Peninsula, Sumatra and Borneo.

238. *Gracula javanensis* ¹⁾.

Corvus javanensis Osbeck, Iter. p. 102 (1757).

¹⁾ With regard to the validity of the generic name *Gracula* see Sclater, Ibis 1892, p. 461 (foot-note).

Gracula javanensis Salvad. Ucc. Born. p. 274; Sharpe, Ibis 1889, p. 132.

Eulabes javanensis Everett, L. B. Born. p. 144; Sharpe, Ibis 1889, p. 280.

Meinatus javanensis Sharpe, Cat. B. Br. Mus. XIII, p. 102.

Five specimens from Pontianak, Smitau, Roema Manoeal, Nanga Raoen, Poetoes Sibau and Poelau; also from the Upper Mahakkam. — Iris dark brown, eyelid alternately black and yellow, wattles orange yellow, bill coral-red with lemon-yellow tip, feet pale yellow. — Contents of stomach: soft fruits.

H a b. Malay Peninsula, Sumatra, Java and Borneo.

•Oriolidac.

239. *Oriolus xanthonotus*.

Oriolus xanthonotus Horsf. Tr. L. Soc. XIII, p. 153 (1822); Salvad.

Ucc. Born. p. 277; Sharpe, Cat. B. Br. Mus. III, p. 213; id. Ibis 1889, p. 185; Everett, L. B. Born. p. 119.

Male and female obtained on Mount Liang Koeboeng, a female at Nanga Raoen, and three males and two females on the Upper Mahakkam. — Iris blood-red, bill brownish red, feet bluish gray, soles yellow.

H a b. Malay Peninsula, Sumatra, Java and Borneo.

•Corvidac.

240. *Platysmurus aterrimus*.

Glaucopis aterrimus Temm. Pl. Col. II, Livr. 57 (1825).

Platysmurus aterrimus Salvad. Ucc. Born. p. 279; Sharpe, Ibis 1889, p. 85; Everett, L. B. Born. p. 146.

Three specimens from Poetoes Sibau and Nanga Raoen; also from the Upper Mahakkam. Living in high forest. — Iris blood-red, bill black, feet grayish black.

H a b. Lowlands of Borneo.

241. *Platylophus coronatus*.

Lanius coronatus Raffl. Trans. Linn. Soc. XIII, p. 306 (1822).

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Platylophus coronatus Salvad. Ucc. Born. p. 280; Sharpe, Ibis 1889, p. 190 (ranged under the family *Prionopidae*); Everett, L. B. Born. p. 147.

Garrulus rufulus Schleg. Handl. Dierk. I, p. 327; id. Mus. P.-B., Coraces, p. 66.

Eight specimens from the forests of Mount Liang Koeboeng and one from the Upper Mahakkam. — Iris dark brown, bill grayish black, feet light blue. — This is a sacred bird amongst the Bahau-tribe on the Upper Mahakkam.

H a b. Sumatra and Borneo.

242. *Corvus tenuirostris*.

Corvus tenuirostris Moore, Cat. B. Mus. E. I. Co. II, p. 558 (1858); Büttik. N. L. M. 1896, p. 185 (Birds from Nias 1).

Corvus validus (nec Bp.) Schleg. Mus. P.-B., Coraces, p. 29; Salvad. Ucc. Born. p. 281; W. Blas. Verh. zool. bot. Ges. Wien, XXXIII, p. 63.

Corone tenuirostris Sharpe, P. Z. S. 1879, p. 246; id. Ibis 1889, p. 81; Everett, L. B. Born. p. 145.

Three specimens from Roema Manoeal, also from the Upper Mahakkam. — Iris, bill and feet black.

H a b. Malay Peninsula, Nias, Sumatra, Borneo and Timor.

Treronidae.

243. *Treron nipalensis*.

Toria nipalensis Hodgson, As. Res. XIX, p. 164 (1836).

Treron nipalensis Salvad. Cat. Birds Brit. Mus. XXI, p. 34.

Treron nasica Schleg. Ned. Tijdschr. Dierk. I, p. 67 (1863); Salvad. Ucc. Born. p. 283; Everett, L. B. Born. p. 196.

Five specimens from Smitau, Roema Manoeal and Mount Liang Koeboeng, and one from the Upper Mahakkam. — Iris golden orange, bare space round the eye pale green, bill yellowish green, base blood-red, feet blood-red.

H a b. From the south-eastern part of the continent through

1) Containing annotations about this and the other species of Crows from the Malay Archipelago.

the Malay Peninsula to Sumatra, Banka, Borneo and the Philippines.

I feel obliged, after a close comparison of all the materials in the Leyden Museum, to unite *T. nasica* Schleg. with *T. nipalensis* Hodgs. When describing *T. nasica*, Schlegel was not acquainted with *T. nipalensis* Hodgs., and in his Catalogue of Columbæ, p. 55, he declares that *T. nasica* seems to differ from *T. nipalensis* only by its smaller size, but comparing the sizes of both species as stated by Salvadori in the Catalogue of Birds mentioned above, I cannot find any noteworthy difference. Salvadori, in his Catalogue says that the Malayan birds are smaller and duller than those from Nepal and Tenasserim, but these differences do not hold well in the numerous specimens before me.

244. *Osmotreron vernans*.

Columba vernans Linn. Mant. Plant. p. 526 (1771).

Treron vernans Salvad. Ucc. Born. p. 286; Everett, L. B. Born. p. 196; Sharpe, Ibis 1890, p. 134.

Six specimens from Pontianak, Nanga Raoen, and Poelau. — Iris blue, encircled with pinkish rosy, bill horny blue, cere greenish yellow, feet purplish red.

Hab. South-eastern corner of Asia, the whole Malay Archipelago with Celebes, the Philippines and Sulu Islands.

245. *Osmotreron fulvicollis*.

Columba fulvicollis Wagl. Syst. Av. Columba, sp. 8 (1827).

Treron fulvicollis Salvad. Ucc. Born. p. 288; Everett, L. B. Born. p. 196; Sharpe, Ibis 1890, p. 134.

Two specimens from Smitau and Poelau. — Iris brown-red, outer ring pink, bill bluish green, cere coral-red, feet coral-red.

Hab. From Cochin China through the Malay Peninsula to Sumatra, Nias, Banka, Billiton and Borneo.

246. *Osmotreron olax*.

Columba olax Temm. Pl. Col. 241 (1823).

Treron olax Salvad. Ucc. Born. p. 289; Everett, L. B. Born. p. 196.

Eight specimens from Pontianak, Roema Manoeal, Nanga Raoen, Poelau and three from the Upper Mahakkam. — Iris white, outer ring purplish rosy, bill yellowish green, feet red. — Among the specimens from the Upper Mahakkam there is a fine adult male (December 19th 1896) in gray plumage, an aberration in color which is very uncommon among *Trerons*. It may be described as follows: crown, sides of head and the whole neck entirely gray; forehead, chin and centre of throat more whitish; back and shoulders entirely olive-yellow; rump, upper tail-coverts, wings and tail gray, tinged with olive-yellow; under wing-coverts gray, lower surface of the body normally colored, but the orange-brown of the chest paler, thighs and under tail-coverts gray, faintly washed with pale rufous.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

247. *Ptilopus jambu*.

Columba jambu Gm. Syst. Nat. II, 2, p. 784 (1788).

Ptilopus jambu Salvad. Ucc. Born. p. 289; Everett, L. B. Born. p. 197; Sharpe, Ibis 1890, p. 134.

Eight specimens from Roema Manoeal, Mount Liang Koeboeng, and Poelau. — Iris red, orbital skin gray, bill orange-yellow, feet purplish red.

Hab. Malay Peninsula, Sumatra, Banka and Borneo.

248. *Carpophaga aenea*.

Columba aenea Linn. Syst. Nat. I, p. 283 (1766).

Carpophaga aenea Salvad. Ucc. Born. p. 290; Everett, L. B. Born. p. 194; Sharpe, Ibis 1890, p. 134.

Numerous specimens from Roema Manoeal, Nanga Raoen, Poelau and Upper Mahakkam. — Iris brown, eyelid crimson, bill blue, cere crimson, feet pinkish.

Hab. South-eastern Asia with Ceylon and the Nicobars, Malay Archipelago to Flores, Sulu Islands and the Philippines.

249. *Carpophaga badia*.

Columba badia Raffl. Trans. Linn. Soc. XIII, p. 317 (1822).

Carpophaga badia Salvad. Ucc. Born. p. 291; Everett, L. B. Born. p. 195; Sharpe, Ibis 1890, p. 135.

An adult male from Long Bloe (Upper Mahakkam). — Iris white, base of bill purplish, tip whitish, feet red.

Hab. Malacca, Sumatra and Borneo ¹⁾.

Columbidae.250. *Turtur tigrinus*.

Columba tigrina Temm. & Knip, Fig. I, p. 43 (1808—11).

Spilopelia tigrina Salvad. Ucc. Born. p. 296.

Turtur tigrina Everett, L. B. Born. p. 193.

An adult male from Long Bloe (Upper Mahakkam). — Iris brown, inner ring pale yellow, bare space round the eye blood-red, feet red. — Contents of stomach: grass-seeds.

Hab. From South-eastern Asia through the Sunda Islands to the Moluccas.

251. *Macropygia ruficeps*.

Columba ruficeps Temm. Pl. col. 561 (1835).

Macropygia ruficeps Salvad. Ucc. Born. p. 298; Everett, L. B. Born. p. 193; Sharpe, Ibis 1890, p. 137.

Four specimens from Nanga Raoen and Mount Liang Koeboeng. — Iris silvery gray, bill black, feet reddish brown.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

252. *Macropygia emiliana*.

Macropygia emiliana Bp. Consp. II, p. 58 (1850); Everett, L. B. Born. p. 193; Sharpe, Ibis 1890, p. 137.

1) Salvadori, Cat. Columbæ in the British Museum, mentions Java as a doubtful habitat of this species. The Leyden Museum is in possession of three specimens ex coll. Van Lidth de Jeude with Java mentioned as habitat, but no collector being mentioned, we may not depend upon the trustworthiness of this fact. The species is wanting in Vorderman's collection of Javan birds.

A female from Long Bloë (Upper Mahakkam). — Iris brown, bill brown, feet red.

Hab. Java, Lomboek and Borneo, where it has been found in the northern parts of the island only.

253. *Geopelia striata*.

Columba striata Linn. Syst. Nat. I, p. 282 (1766).

Geopelia striata Salvad. Ucc. Born. p. 298; Everett, L. B. Born. p. 194.

An adult specimen from Pontianak.

Hab. Malay Peninsula, entire Malay Archipelago and the Philippines.

Gouridae.

254. *Chalcophaps indica*.

Columba indica Linn. Syst. Nat. I, p. 284 (1766).

Chalcophaps indica Salvad. Ucc. Born. p. 299; Everett, L. B. Born. p. 194; Sharpe, Ibis 1890, p. 136.

Four specimens from Roema Manoel and Poelau, and seven from the Upper Mahakkam. — Iris dark brown, bill coral-red with the basal part brown, feet red.

Hab. From South-eastern Asia, through the Malay Archipelago and the Moluccas to New Guinea.

Phasianidae.

255. *Argusianus Grayi*.

Argus Grayi Elliot, Ibis 1865, p. 423.

Argusianus Grayi Salvad. Ucc. Born. p. 305; Everett, L. B. Born. p. 197; Sharpe, Ibis 1890, p. 138.

Seven specimens from Mount Kenepai, Mount Liang Koeboeng and the Upper Mahakkam. — Iris brown, bare skin on face and throat purplish blue, feet coral-red.

Hab. Borneo, where it is an inhabitant of mountain-forests.

256. *Lobiophasis Bulweri*.

Lobiophasis Bulweri Sharpe, Ann. Mag. Nat. His. (4) XVI, p. 73 (1874); Everett, L. B. Born. p. 198.

Four males and four females from Mount Liang Koeboeng and from the Bruny River (Upper Mahakkam). — Iris red, bare skin on face and the wattles sky-blue, hind edging of the erect ear-wattles in the fully adult male black, consisting of a very short, brush-like covering of scale-like hairs, bill horny brown, lower mandible horny blue, feet coral-red.

This bird is, like the previous species, very shy and living very retired in the thickest mountain-forest. Two of the above mentioned females were caught in snares by my Dyak huntsmen, and the same is said in Mr. von Berchthold's annotations about the specimens obtained on the Upper Mahakkam. It is of interest that, while the occipital feathers in an adult male are steel-blue and rather short, they are, in another adult male with still more developed spurs and strongly developed testes (probably in the breeding-season) lengthened to a kind of crest, and reddish brown with black tips. This crested specimen has the wattles very strongly developed and, as mentioned above, the hind edge of the ear-wattles covered with a kind of brush-like hairs. As a rule, I suppose, the wattles will show the greatest development in the breeding season, the male with strongly developed testes and full plumage, obtained in December, has the wattles very long and broad, while in others showing signs of moulting and caught in October, have the wattles less fully developed. Besides the long ear- and baird-wattles, the adult males show a third pair of wattles, though very small, halfway between eye and nostril. All our fully adult specimens have chin and throat thinly covered with short black feathers. In adult males the spur is less strongly developed than in the genus *Lophura*, and not longer than 12 mm., while in the female the spur is only represented by a conspicuous knob. As to the

number of tail-feathers, which is said by Sharpe to be thirty-two in the male and twenty-eight in the female, I can say that it is thirty in males and females. The outermost as well as the innermost tail-feathers are shorter than the neighbouring one, while the seventh or eighth pair are the longest. The longer upper tail-coverts in the adult male are pure white and rather long and nearly halfway covering the tail-feathers. The wings are strongly rounded, and the primaries are surpassing the secondaries by not more than 10—20 cm. in the male, while in the female they are nearly covered by the secondaries.

H a b. The more elevated regions of the interior of Borneo.

257. *Lophura nobilis*.

Euplocomus nobilis Sclat. P. Z. S. 1863, p. 119; Salvad. Ucc. Born. p. 306; Everett, L. B. Born. p. 199.

Lophura nobilis Büttik. N. L. M. 1895 (XVII), p. 175.

Two males and three females from Roema Manoeal and the Bruny River (Upper Mahakkam). — Iris red, naked skin of face and wattles blue, bill horny gray, base dirty reddish yellow; feet in the males horny white, each scale edged with red at the base; in the female the legs are yellow. — This species is an inhabitant of the thickest jungle and hardly ever seen by a huntsman. All our specimens, as most of the other galline birds obtained during the expedition, have been snared by the natives.

H a b. Banka and Borneo.

Rollulidae.

258. *Rollulus roulroul*.

Phasianus roulroul Scop. Del. Flor. et Faun. Insubr. II, p. 93 (1786).

Rollulus roulroul Salvad. Ucc. Born. p. 308; Everett, L. B. Born. p. 200; Sharpe, Ibis 1890, p. 140.

A great number of males and females obtained at Roema Manoeal, in the forests of Mount Kenepai and Liang Koe-boeng, and on the Upper Mahakkam. — Iris brown, naked

parts of the face blood-red, bill black, base blood-red, feet blood-red. In the female the red at the base of the bill is reduced to the angle of the mouth. — Most frequently found in bamboo-jungle.

Hab. Malay Peninsula, Sumatra, Java and Borneo.

259. *Melanoperdix nigra*.

Cryptonyx niger Vig. Zool. Journ. IV, p. 349 (1829).

Melanoperdix nigra Salvad. Ucc. Born. p. 309; Everett, L. B. Born. p. 199.

Numerous specimens of both sexes obtained at Roema Manoel and on Mount Kenepai. — Iris dark brown, bill black, feet grayish blue. — This species inhabits brushwood and high bamboo-jungle.

Hab. Malay Peninsula, Sumatra and Borneo.

Perdicidae.

260. *Excalfactoria chinensis*.

Tetrao chinensis Linn. S. N. I, p. 277 (1766).

Excalfactoria chinensis Salvad. Ucc. Born. p. 311; Everett, L. B. Born. p. 200; Sharpe, Ibis 1890, p. 140.

Excalfactoria lineata Grant, Cat. B. Br. Mus. XXII, p. 253.

Five specimens from Pontianak, Sanggau and Mount Kenepai, and two from the Upper Mahakkam. — Iris red, bill black, feet yellow. — Plentiful in old and abandoned plantations.

Hab. India, South-east Asia, Malay Archipelago, the Philippines, Celebes and Australia.

Charadriidae.

261. *Charadrius dominicus*.

Charadrius dominicus P. L. S. Müll. Syst. Nat. Anh. p. 116 (1766); Sharpe, Cat. B. Br. Mus. XXIV, p. 195.

Charadrius fulvus Salvad. Ucc. Born. p. 313; Everett, L. B. Born. p. 204; Sharpe, Ibis 1890, p. 142.

Notes from the Leyden Museum, Vol. XXI.

Three specimens from Pontianak. — Iris brown, bill black, feet gray.

Hab. America and Asia, migrating as far as Australia.

Scolopacidae.

262. *Tringoides hypoleucos*.

Tringa hypoleucos Linn. Syst. Nat. I, p. 250 (1766).

Tringoides hypoleucos Salvad. Ucc. Born. p. 326; Everett, L. B. Born. p. 208; Sharpe, Ibis 1890, p. 144.

Six specimens from Pontianak and Smitau, and five from the Upper Mahakkam. — Common in winter along the rivers and on inundated fields. — Iris brown, bill and feet gray.

Hab. Old world as far south as Australia.

Rallidae.

263. *Rallina fasciata*.

Rallus fasciatus Raffl. Tr. Linn. Soc. XIII, p. 328 (1822).

Rallina fasciata Salvad. Ucc. Born. p. 337; Everett, L. B. Born. p. 201; Sharpe, Ibis 1890, p. 145.

A specimen from Pontianak and another from the Upper Mahakkam. — Iris red, bill grayish horn-color, feet coral-red.

Hab. From Burma through the Malay Peninsula, the Sunda Islands, Celebes and the Moluccas.

264. *Amaurornis phoenicura*.

Rallus phoenicurus Forster, Zool. Ind. p. 19, pl. 9 (1781).

Erythra phoenicura Salvad. Ucc. Born. p. 340; Everett, L. B. Born. p. 302; Sharpe, Ibis 1890, p. 145.

Amaurornis phoenicura Sharpe, Cat. B. Br. Mus. XXIII, p. 156.

One specimen from Smitau. — Iris reddish brown, bill green, base of upper mandible red, feet greenish yellow.

Hab. South-eastern Asia, the Sunda Islands and Celebes.

Ardeidae.265. *Ardea sumatrana*.

Ardea sumatrana Raffl. Trans. Linn. Soc. XIII, p. 325 (1821); Salvad. Ucc. Born. p. 344; Everett, L. B. Born. p. 188; Sharpe, Ibis 1890, p. 146.

Repeatedly met with on the banks of the Kapoeas River below Poetoes Sibau. No specimens collected.

Hab. From British India through the Malay Archipelago to Australia.

266. *Bubulcus coromandus*.

Cancroma coromanda Bodd. Tabl. Pl. Enl. p. 54 (1783).

Bubulcus coromandus Salvad. Ucc. Born. p. 350; Everett, L. B. Born. p. 189; Sharpe, Ibis 1890, p. 146.

An adult, pure white female from the Bruny River (Upper Mahakkam); not collected, though rather common, on the Upper Kapoeas. — Iris sulphur-yellow, surrounded with a white ring, bill and bare parts of the face lemon-yellow, feet ashy gray yielding to olive-green. — Contents of stomach: small fish and apparently a number of leeches.

Hab. From India and Ceylon throughout South-eastern Asia and the Malay Archipelago.

267. *Ardetta sinensis*.

Ardea sinensis Gm. Syst. Nat. I, p. 642 (1788).

Ardetta sinensis Salvad. Ucc. Born. p. 354; Everett, L. B. Born. p. 190; Sharpe, Ibis 1890, p. 148.

An adult female from Pontianak (Moret). — Iris yellow, bill yellow with the culmen black, feet greenish yellow.

Hab. From Eastern and South-eastern Asia through the Malay Archipelago and the Philippines to Celebes and Flores.

268. *Ardetta cinnamomea*.

Ardea cinnamomea Gm. Syst. Nat. I, p. 643 (1788).

Notes from the Leyden Museum, Vol. XXI.

Ardetta cinnamomea Salvad. Ucc. Born. p. 354; Everett, L. B. Born. p. 190; Sharpe, Ibis 1890, p. 147.

A male collected at Pontianak (Moret) and two females from the Upper and Lower Mahakkam. — Iris yellow, bill lemon-yellow, ridge black, feet dirty olive-green.

Hab. From India and Ceylon through Burmah and the Malay Peninsula to the Sunda Islands and the Philippines.

Ciconiidae.

269. *Melanopelargus episcopus*.

Ardea episcopus Bodd. Tabl. Pl. Enl. p. 54 (1783).

Melanopelargus episcopus Salvad. Ucc. Born. p. 356; Everett, L. B. Born. p. 191.

An adult male obtained near Poetoës Sibau by Dr. Nieuwenhuis. — Iris pale yellow with an outer ring brown, bare skin round the eyes and on the throat Naples-yellow, bill dark red, feet Sienna-yellow. — Contents of stomach: earthworms of a species which is very plentiful in the mud of the river-banks. — This bird is not rare on the banks of the Kapoeas, but it is rather shy and not easily got within gun-shot. Some five specimens together used to pass the night on high trees dominating the low forest on the Sibau River.

Hab. Africa, Southern Asia and the Sunda Islands.

Rotterdam, September 1899.

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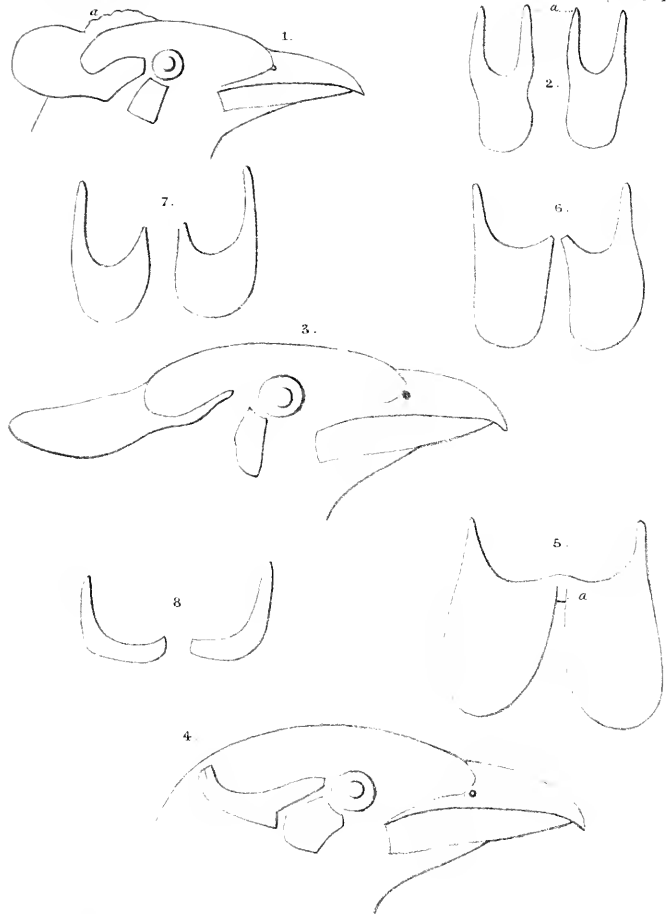
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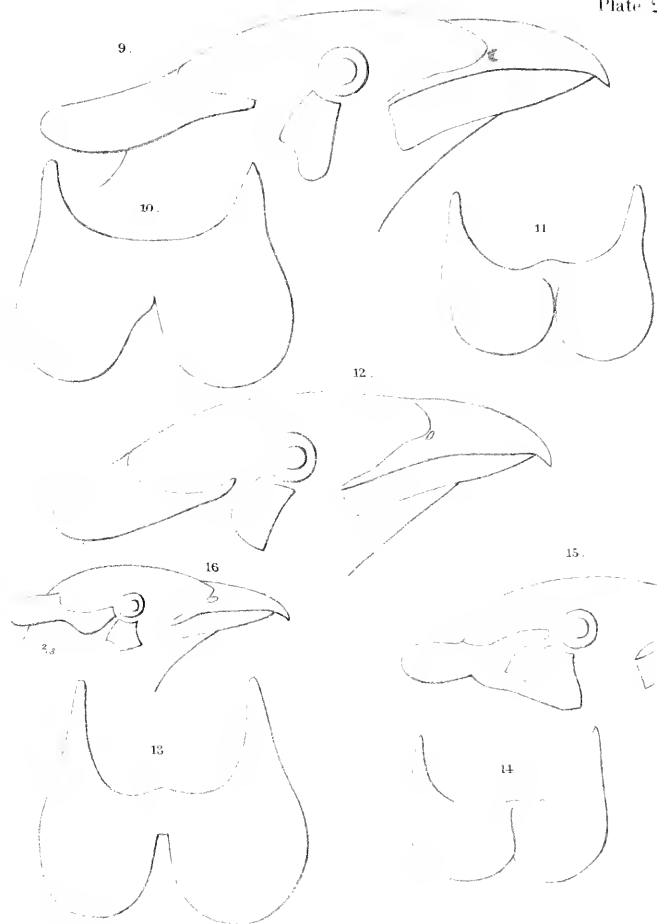
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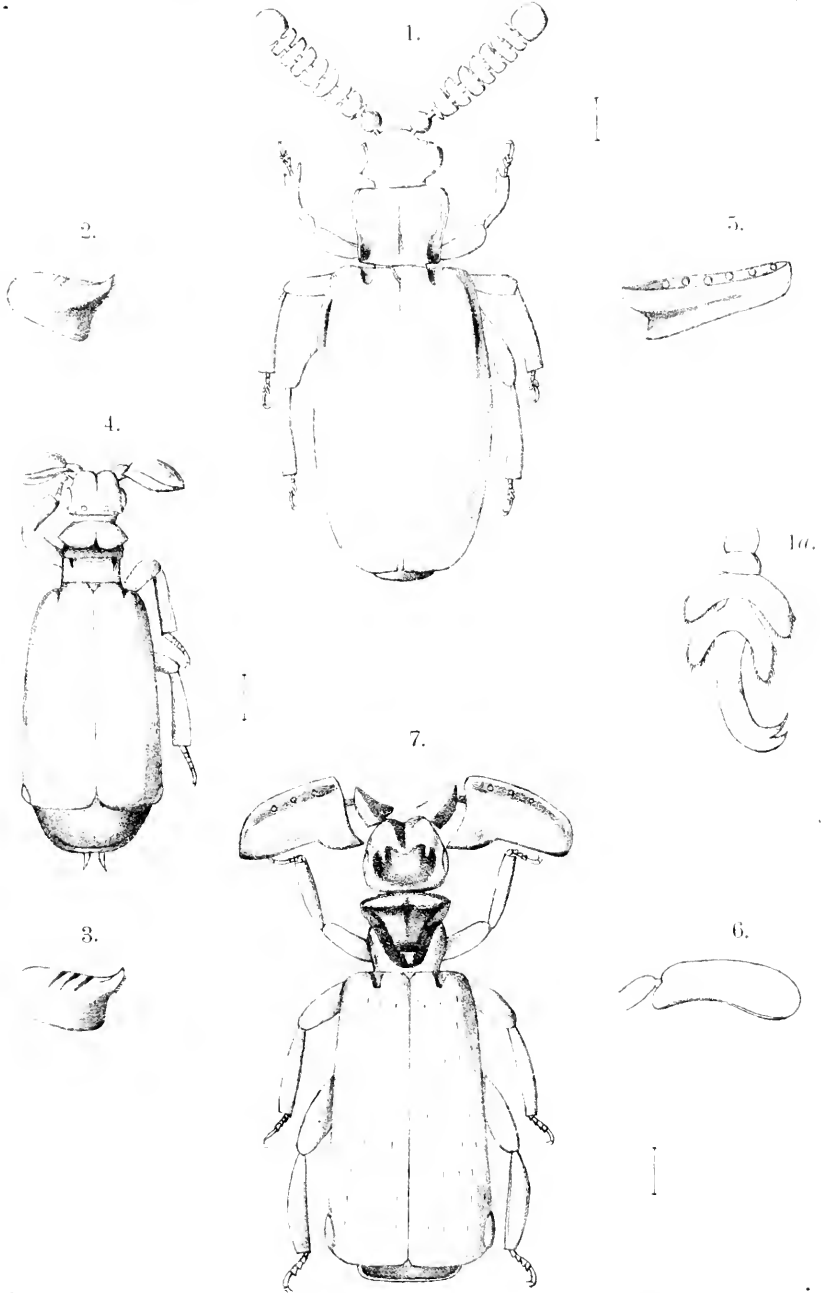
1—2. *Gracula religiosa* Linn.
3—8. " *javanensis* (Osb.)



Ch. Rosen lith.

P. W. M. Trap nipi

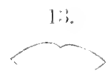
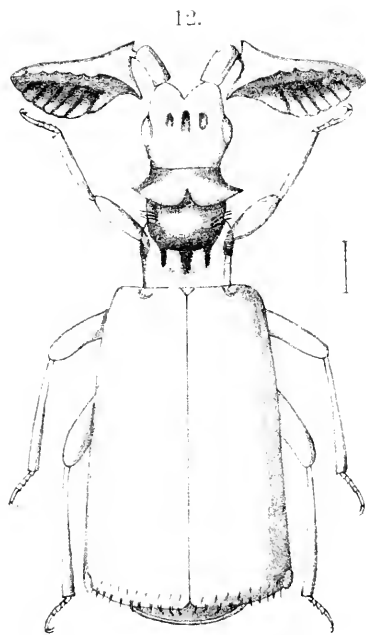
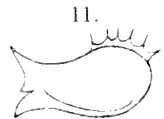
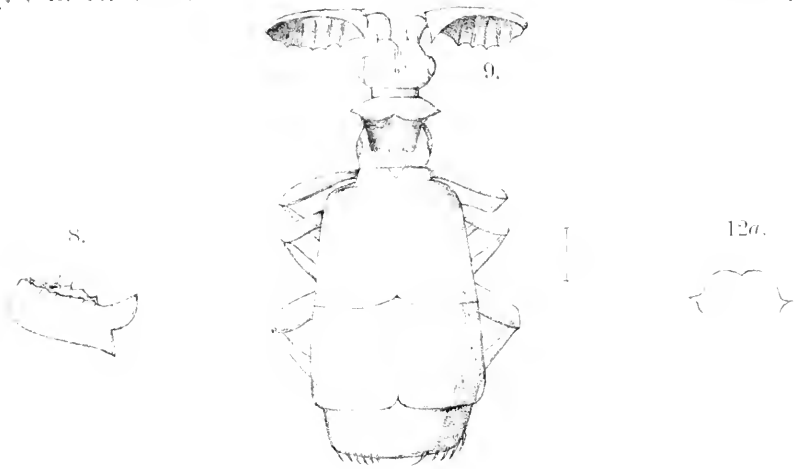
9—11. *Gracula robusta* Salvad.
12—14. " *batuensis* Finsch.
15. " *intermedia* (Hav).
16. " *andamanensis* (Tyther).



Er. Wasm. ad nat. del.

Ca. Ritsema lith.
Neue Paussiden.

P. W. M. Trap impr.

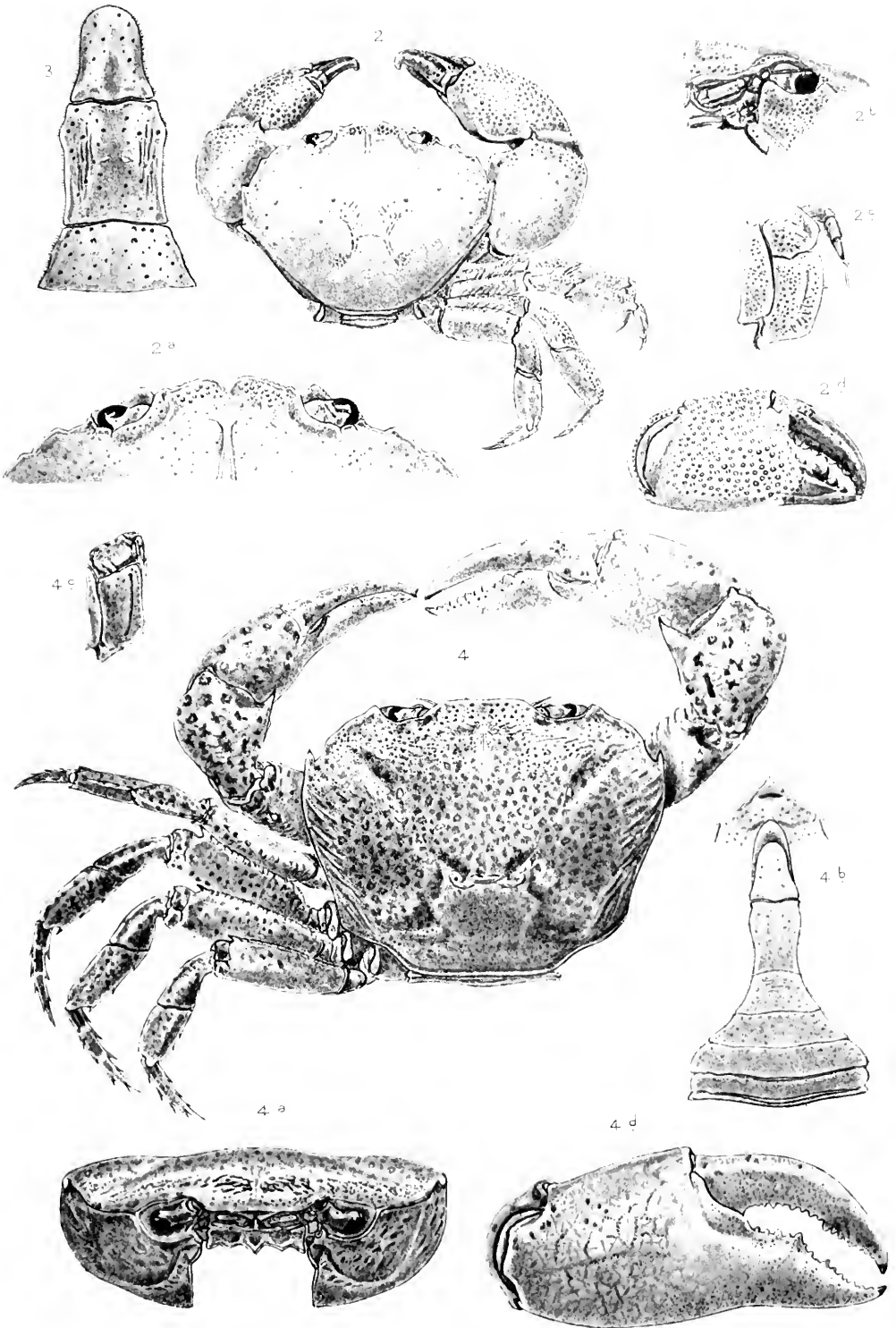


Er. Wasm. ad nat. del.

Ca. Ritsema lith.
Neue Paussiden.

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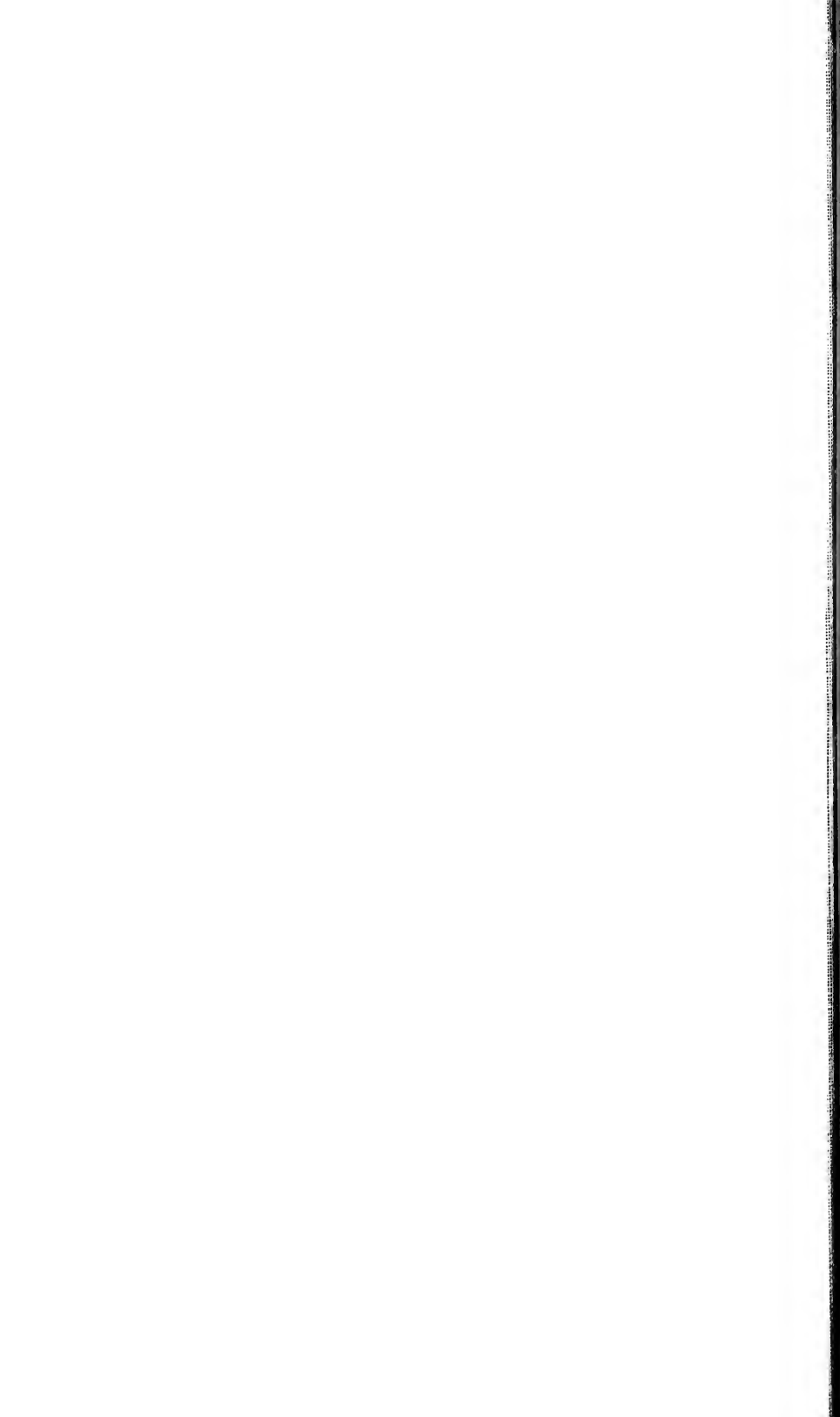


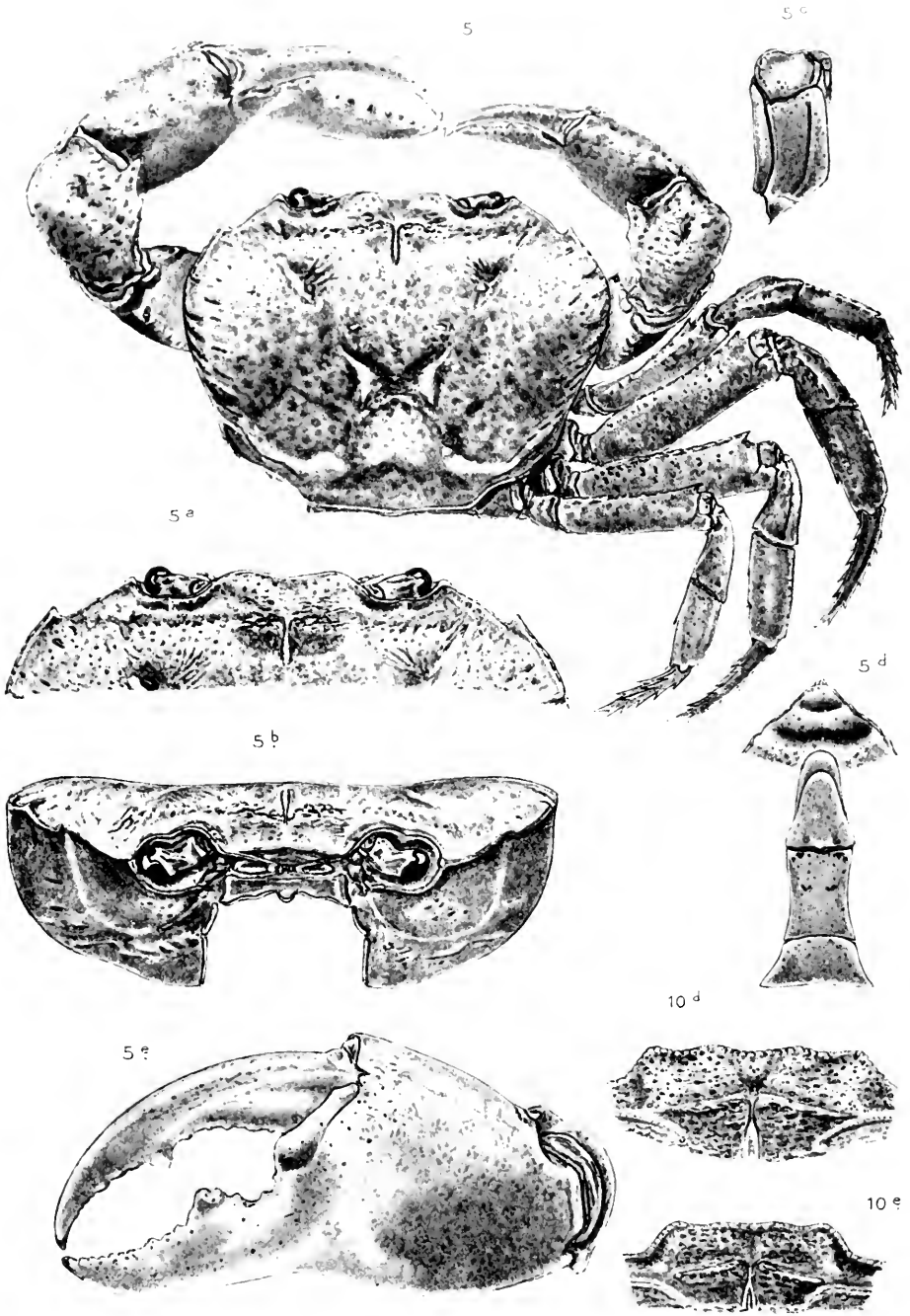


DR J. G. DE MAN DEL

MJM JAN. LEER, AMSTERDAM

2. *Menippe Ortmani* DE MAN. 3. *Parathelphusa tridentata* H.M.E.
 4. *Potamon borneense* MARTS, VAR. *hilaris* DE MAN.

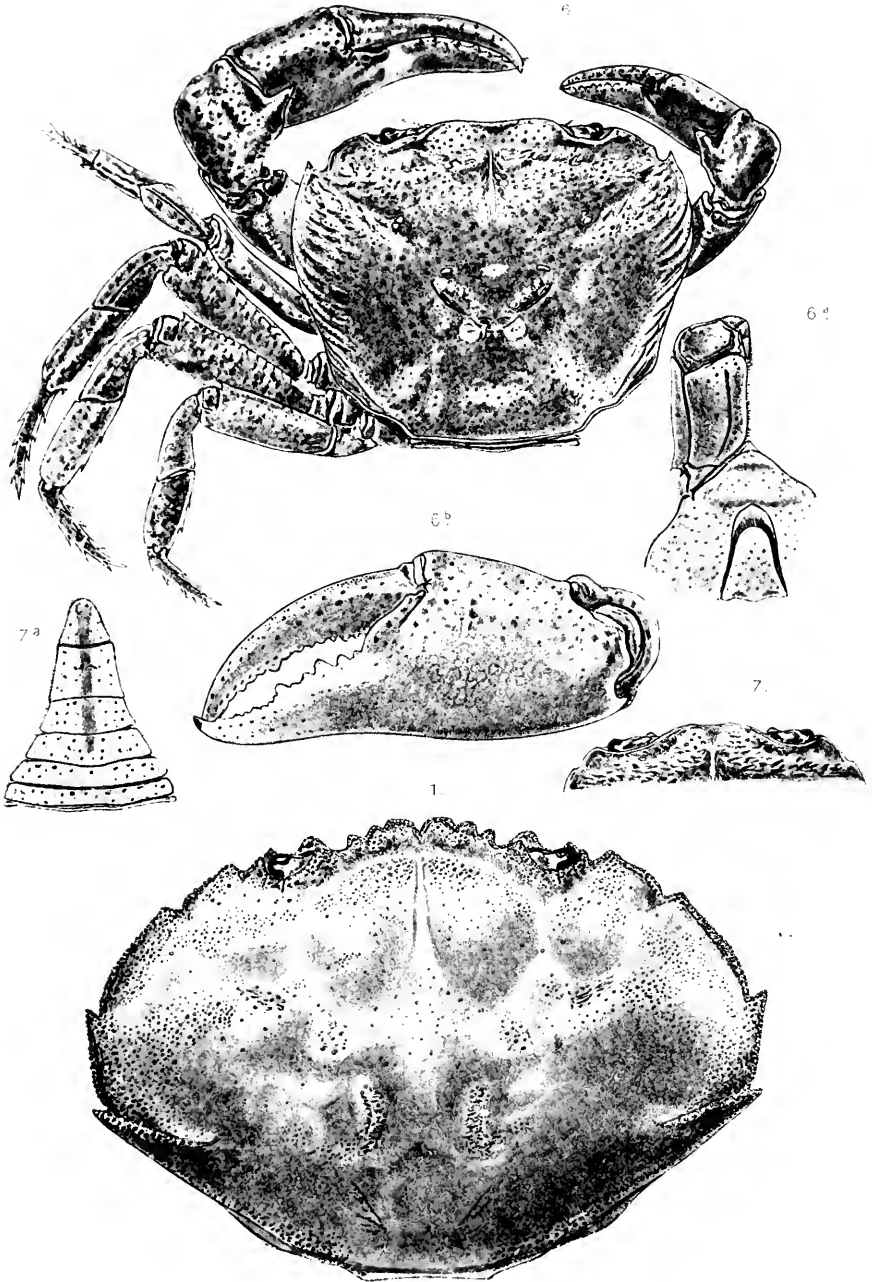




D^r J G DE MAN DEL

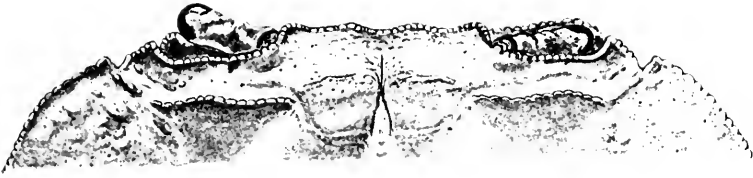
MPP. VAN LEEER AMSTERDAM

5. *Potamon Büttikoferi* DE MAN. 10. *Potamon consobrinum* DE MAN.

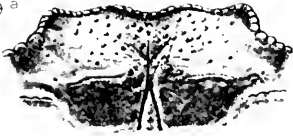


1. *Myomenippe Leguillouii* A.M.E. 6. *Potamon silvicola* DE MAN.
 7. *Potamon* sp.

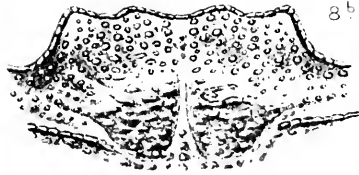
9.



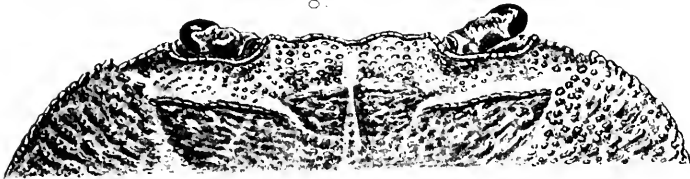
9^a



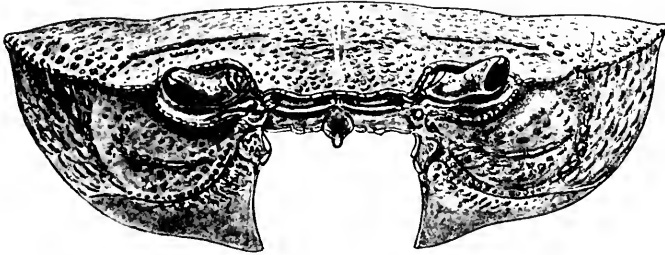
9^b



8.



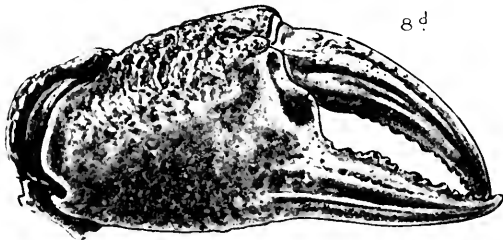
8^a



8^c



8^d



8. *Potamon mahakkamense* DE MAN.
9. *Potamon sinuatifrons* H. M. E.

9 b



9 c



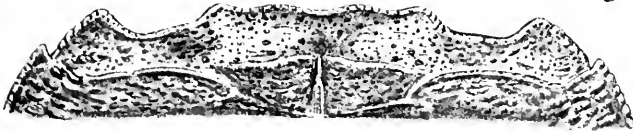
10 g



10 d



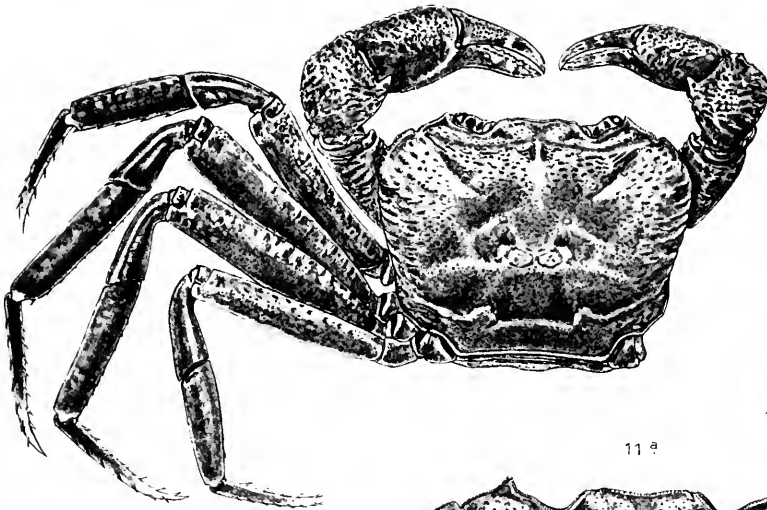
10 b



10 f



11.



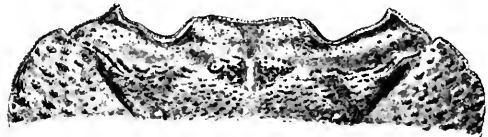
11 e



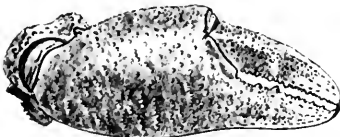
11 d



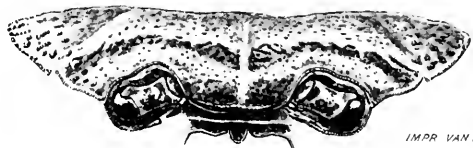
11 a



11 c



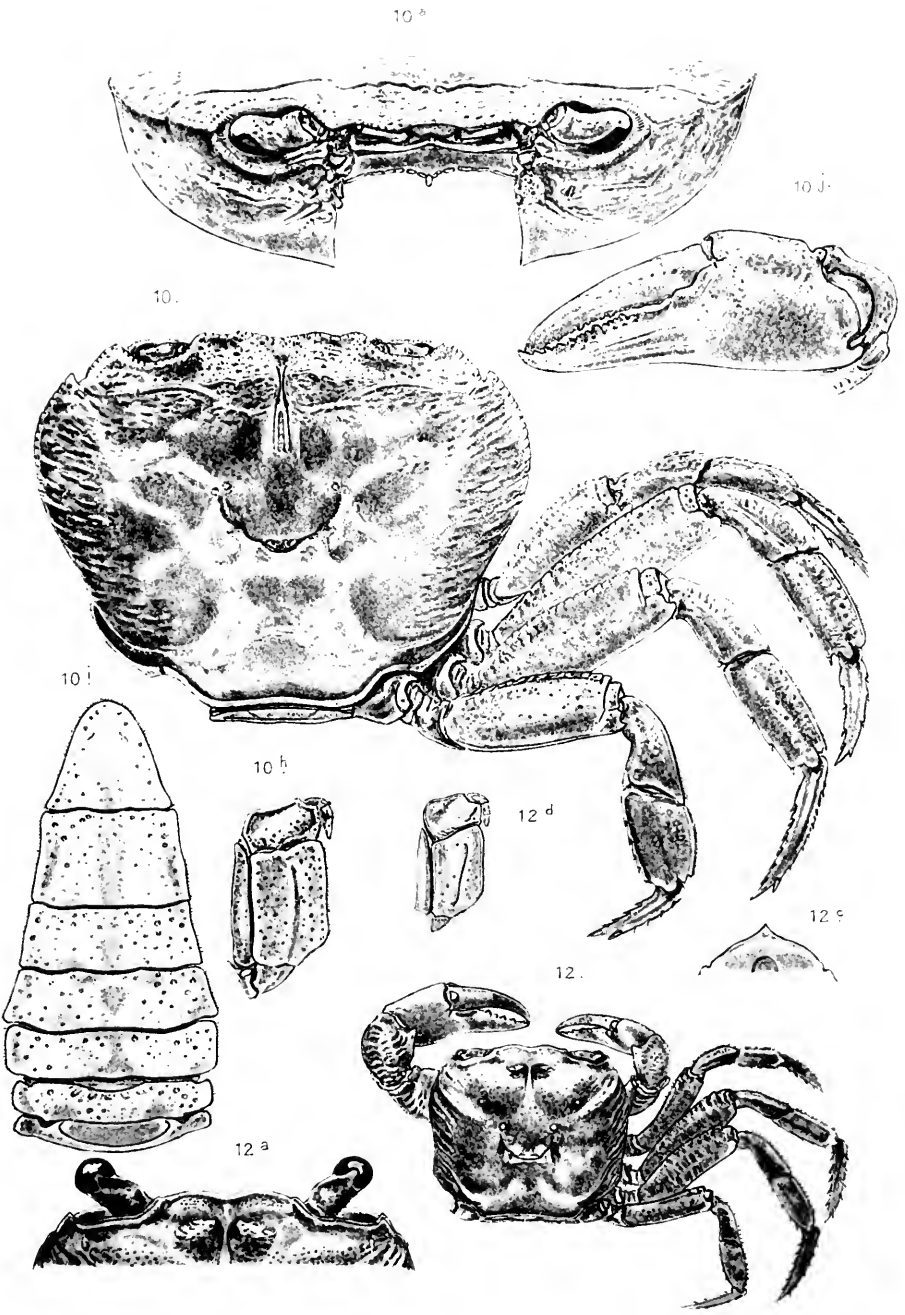
11 b



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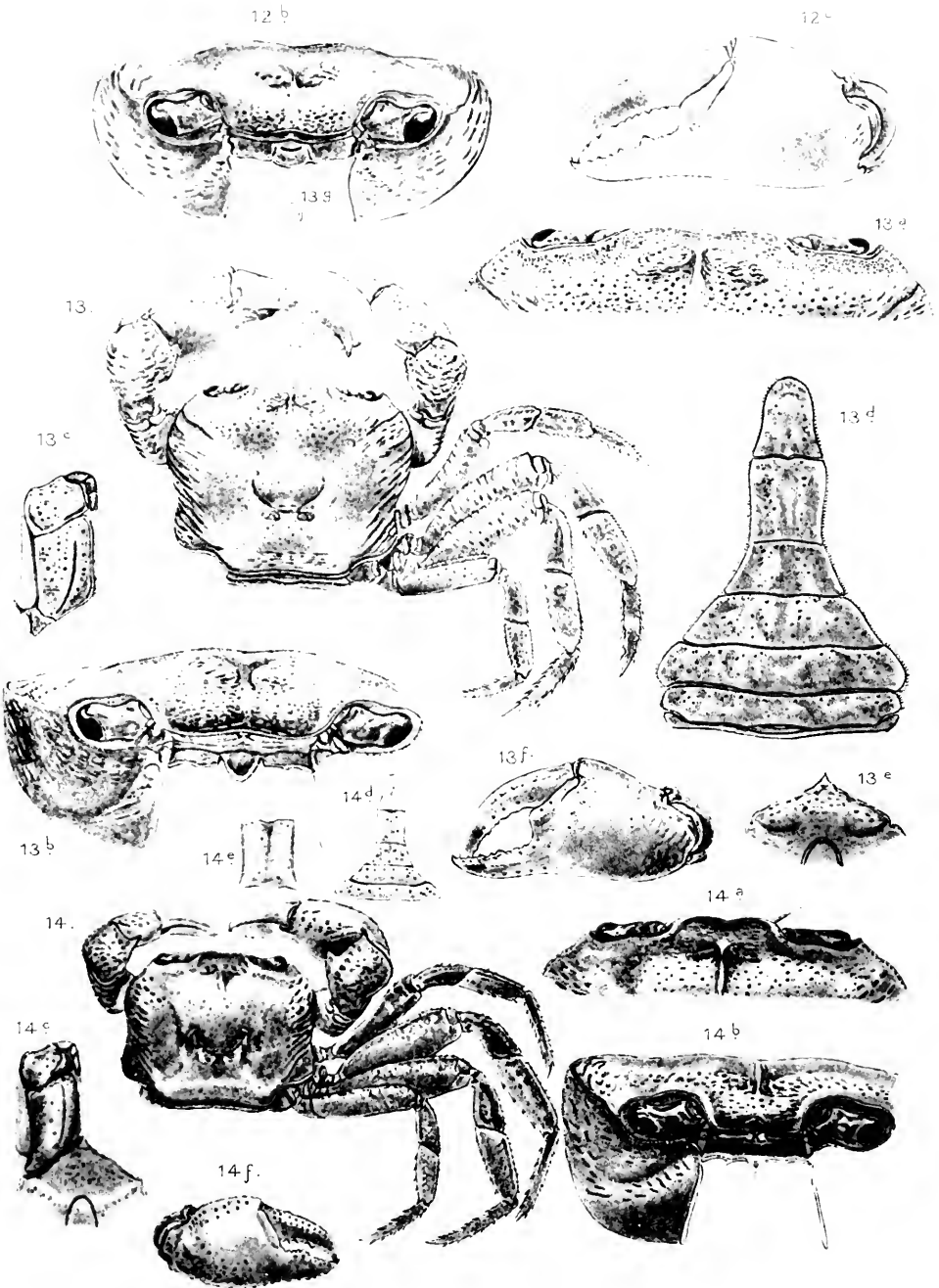
9. *Potamon sinuatifrons* H.M.E. 10. *Potamon consobrinum* DE MAN. 11. *Potamon Melanippe* DE MAN.



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10. *Potamon consobrinum* DE MAN. 12. *Potamon kenepai* DE MAN.



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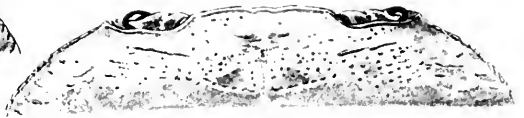
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12. *Potamon kenepai* DE MAN. 13. *Potamon hendersonianum* DE MAN.
14. *Potamon Burgeri* DE MAN.

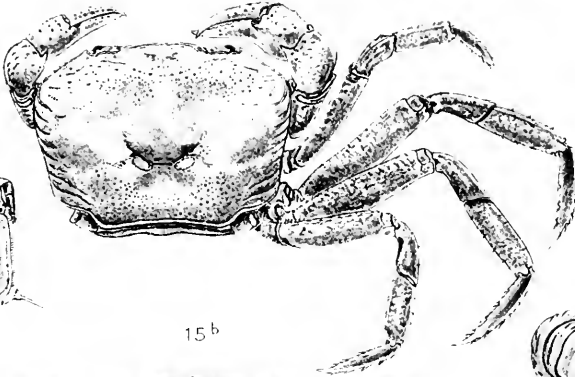
14 ♀



15 ♀

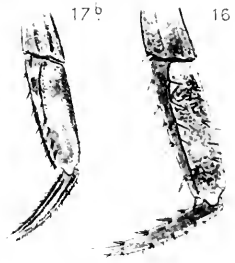


15



17 ♀

16 ♀

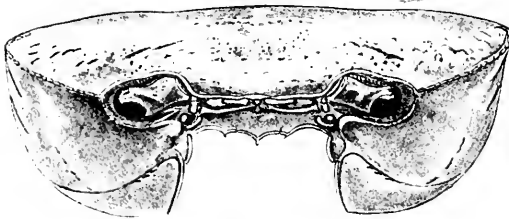


15 ♂



15 b

15 d

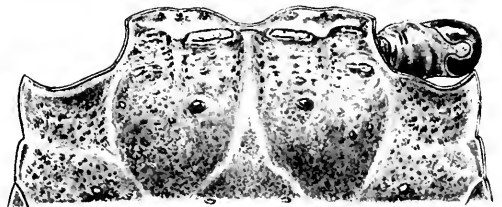


16 a



16

17.



17 ♀



16 c

16 b



16 d



14 ♀: *Potamon Burgeri* DE MAN. 15. *Potamon bicristatum* DE MAN. 16. *Sesarma Amphinome* DE MAN. 17. *Sesarma angustifrons* A.M.E.



J. G. Keenan del. et lith.

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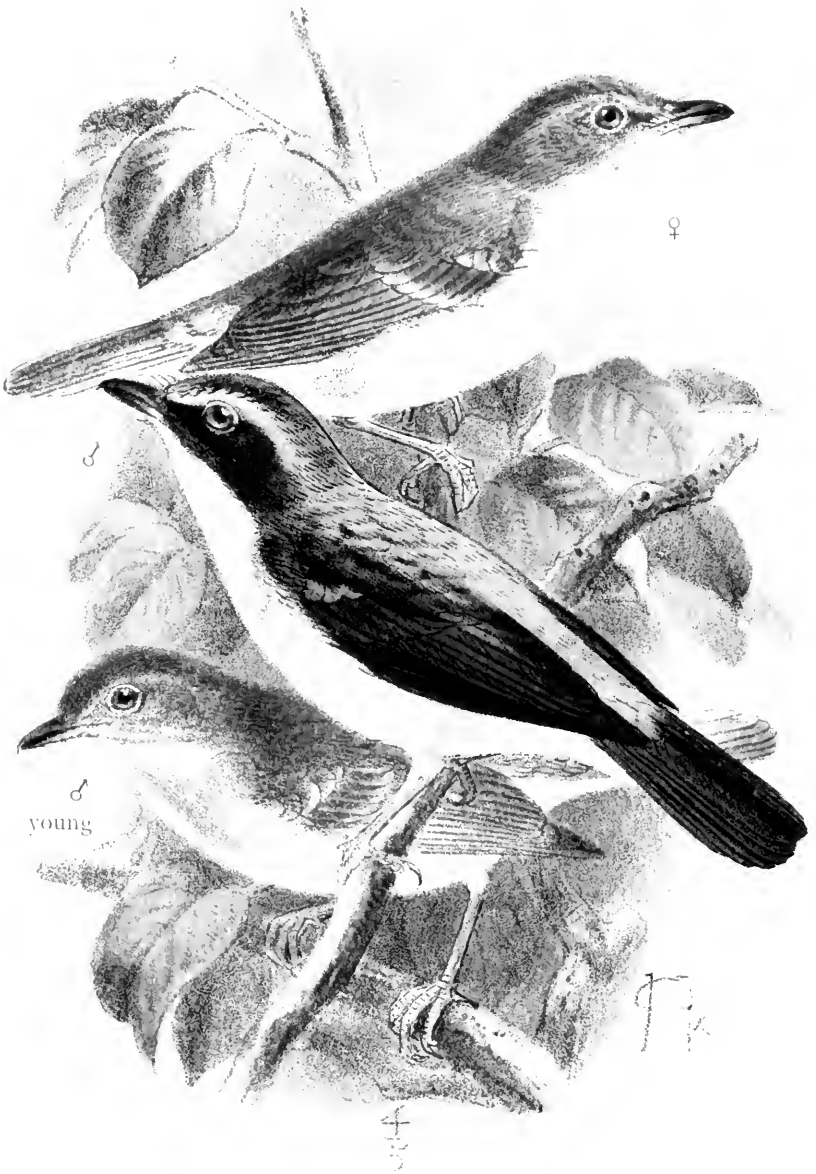
Glaucidium sylvaticum (Bp.)



J. G. Keuleman. del. et lith.

P. W. M. Trap inopi

Siphia Everetti Sharpe.



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P. W. M. Trap impr.

Siphia beccariana (Salvad.)



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