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VAN HET

TRANSVAAL MUSEUM

VOLUME VI



Printed for the

COMMITTEE OF THE TRANSVAAL MUSEUM
BY THE UNIVERSITY PRESS,
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PRINTED IN GREAT BRITAIN

LIST OF CONTENTS

VOLUME VI

	PAGE
HEWITT, JOHN	
Descriptions of New South African Araneae and Solifugae. (4 Plates and 13 Text-figures)	63
MEYRICK, E., B.A., F.R.S.	
Descriptions of South African Micro-Lepidoptera	7
POTT, R. (Mrs)	
A New Species of Warburgia from the Transvaal. (2 Text-figures) .	60
Addendum to the First Check-list of the Flowering Plants and Ferns of the Transvaal and Swaziland. (2 Text-figures)	119
ROBERTS, AUSTIN	
Descriptions of a New Species and Genus of Flycatchers from East Africa, and two New Subspecies of Guinea Fowls from South Africa	1
Descriptions of two New Species of a New Subgenus of Bats, and a New Species of Molerats	4
Descriptions of some New Mammals	112
Some notes on Birds, and Descriptions of New Subspecies	116

INDEX TO VOLUME VI

(New genera, subgenera, species, subspecies, and the main reference in a series of references in heavy-faced type; synonyms are in italics.)

- abrahami, *Acanthodon*, 76, 111
Abutilon, 130
abyssinicum, *Asplenium*, 120
Acacia, 126
Acalypha, 129
ACANTHACEAE, 133
Acanthodon, 63, 67, 75, 102, 107, 110, 111
acaulis, *Geigeria*, 135
Acompsia, 20
Acrocercops, 39
Acrostichum, 121
aculeastrum, *Solanum*, 133
aculeata, *Aloe*, 122
 Eulophia, 124
 Toddalia, 128
aculeatum, *Polystichum*, 120
acuminata, *Markhamia*, 133
acuta, *Adenocline*, 130
 Elaeophorbia, 129
 Lotononis calycina, 127
acutifolia, *Melothria*, 134
acutilobus, *Cucumis africanus*, 134
ADELIDAE, 47, 59
adendorffi, *Mirafra apiata*, 117
Adenia, 131
Adenocline, 130
Adiantopsis, 121
aegyptiacus, *Nyctinomus*, 4, 5
aethiopica, *Zantedeschia*, 122
affinis, *Aloe*, 122
 Cluytia, 129
 Tragia, 130
africana, *Dryopteris*, 120
 Plukenetia, 130
 Salvia, 133
africanum, *Psilotrichum*, 125
 Thamnosma, 128
AIZOACEAE, 125
alata, *Pentatricha*, 134
Albizzia, 126
albogularis, *Crithagra*, 116
albomaculata, *Zantedeschia*, 122
Alchemilla, 126
Alepidea, 132
allevata, *Hyalochna*, 30
Allotalanta, 30
Aloe, 122
AMARANTACEAE, 125
AMARYLLIDACEAE, 122
Ammannia, 131
Amphilophis, 121
amphizeucta, *Lachnostola*, 22
amplexicaule, *Ecbolium*, 133
Anacamopsis, 19, 20
ANACARDIACEAE, 130
Anaglypha, 134
Anarsia, 21
Ancylometis, 27
Ancylotrypa, 108, 109
Andropogon, 121
angulatum, *Abutilon*, 130
angustata, *Acalypha*, 129
angustifolia, *Merremia*, 132
Anisotes, 133
anomalous, *Georchus*, 5
ANONACEAE, 126
antennifera, *Bonatea*, 123
anthelmintica, *Albizzia*, 126
Anthericum, 122
Antispila, 35
aphrocyma, *Acrocercops*, 39
apiata, *Mirafra*, 117
aponeurus, *Hibiscus*, 130
Aponogeton, 121
APONOGETONACEAE, 121
Apotactis, 52
approximans, *Euplectes*, 117
aquilina, *Pteris*, 121
aquilinum, *Pteridium*, 121
arabica, *Psiadia*, 134
arabicus, *Lotus*, 128
Arabis, 126
ARACEAE, 122
ARANEAE, 63, 67
areata, *Laspeyresia*, 13
arenophilum, *Tryplostemma*, 131
arguta, *Blastobasis*, 36
Argyrolobium, 127, 128
Argyroploce, 11, 12, 50
argyrozona, *Antispila*, 35
aristata, *Chaetacme*, 124
 Lotononis, 127
 Pearsonia, 127
aristatum, *Aspidium*, 120
 Polystichum, 120
Aristotelia, 15, 16
armatus, *Spiroctenus*, 86, 87 (Text-fig. 7 d)
Arthrosolen, 131
artifex, *Stasimopus*, 95
ASCLEPIADACEAE, 132
asiatica, *Chrysochloris*, 113, 114
aspera, *Eragrostis*, 122
 Geigeria, 135
asperata, *Tinea*, 44
aspidioides, *Asplenium*, 120

- Aspidium, 120
 Asplenium, 120
 assimilis, Pavetta, 134
 asterias, Thesium, 125
asterota, Argyroploce, 12
 Astragalus, 128
 athamantica, Dryopteris, 120
athamanticum, Nephrodium, 120
athanasioides, Brachymeris, 135
Pentzia, 135
 Atherstonei, Pearsonia, 127
 Satyrium, 123
 Athyrium, 120
atrisecta, Hapsifera, 58
 atropurpurea, Pupalia, 125
 attenuata, Cephalaria, 134
Lomaria, 120
 attenuatum, Blechnum, 120
 augur, Rhinolophus, 112
Aulotropha, 32
 aurantiaca, Sandersonia, 122
 aurantiacus, Gladiolus, 123
 aurea, Gymnogramme, 120
Gymnogramme argentea, 120
 auriculata, Tripteris, 135
 aurita, Blumea, 134
austerodes, Chelaria, 22
 australis, Crotalaria petiolaris, 127
 Evagrus caffer, 63, 95 (Text-figs.
 10 a, b)
 Thelechoris, 95, 109
autograpta, Leucoptera, 40
automorpha, Syrmadaula, 26
 Autosticha, 26
 AVICULARIIDAE, 63, 67
 azorella, Muraltia, 129
- babaeculus, Bradypterus, 116
 Bainesii, Lotononis, 127
 Bakeri, Eulophia, 124
 Barberton, Crassula perfoliata, 126
 Barbertoni, Habenaria, 123
 Barbertoniae, Aloe, 122
 barratti, Bradypterus, 116
 BARYCHELIDAE, 97
 BARYCHELINAE, 96
 basinuda, Alepidea, 132
 Batrachedra, 28
Baurii, Ranunculus, 126
 Bellidiastrum, Venedium, 135
benedicta, Ceromitia, 47
 Tacazzea apiculata, 132
 Benthami, Acacia, 126
 Bergia, 131
 bergiana, Dryopteris, 120
bergianum, Nephrodium, 120
 Berkheya, 135
 Berkheyopsis, 135
 Bersama, 130
 Bessia, 86, 88, 107
 biaurita, Pteris, 121
 bicolor, Habenaria, 123
 bifurcum, Solanum, 133
 BIGNONIACEAE, 133
 biharicus, Idiops, 110
 biloba, Marsilia macrocarpa, 121
binotata, Lecithocera, 24
 bipinnatum, Asplenium, 120
bisecta, Eucosma, 10
bivia, Dragmatucha, 25
 bivittatus, Diorea, 105, 106 (Text-fig.
 13 d)
 BLASTOBASIDAE, 36, 55
 Blastobasis, 36, 55
 Blechnum, 120
 Blepharis, 133
 Blossia, 63, 64
 Blumea, 134
 Boltoni, Bonatea, 123
 Bolusii, Euphorbia, 129
 Pleiospora, 127
 Bonatea, 123
 BORAGINEAE, 132
boryana, Lomaria, 120
 Bovinae, 111
 Bowkeri, Pelargonium, 128
 Brachiaria, 122
 Brachionopus, 96
 Brachmia, 25, 26
brachycephalus, Ceratogyrus, 63, 103;
 Pl. I, figs. a-c
 Brachycorythis, 123
brachycorythis, Platanthera, 123
 Brachymeris, 135
 brachyphyllus, Gladiolus, 123
 brachypterus, Bradypterus, 116
 bracteata, Tricalysia, 133
 Bradypterus, 116
 Brassica, 126
 breijeri, Pelmatorycter, 92
 Brenthia, 36
 brevedunculata, Pleiospora obovata,
 127
 brevifolius, Gladiolus varius, 123
breyeri, Pelmatorycter, 63, 91 (Text-
 fig. 9); Pl. II, fig. c
Pterinochilus, 63, 102
Breyeri, Warburgia, 60 (Text-fig. 1),
 61 (Text-figs. 2a-g), 131
 Bridelia, 129
 brizantha, Brachiaria, 122
brizanthum, Panicum, 122
 Brownleea, 123
 Bucculatrix, 42
 Buchananii, Dryopteris, 120
Nephrodium, 120
 Buchenroedera, 128
 Bulbostylus, 122
bullifera, Platyptilia, 7
 Bupleurum, 132
 burkeanus, Astragalus, 128
 Burkei, Thesium, 125

- BURSERACEAE, 128
byrsoxantha, Trichotaphe, 23

 Cadaba, 126
 caerulea, Sutura, 133
 caffer, Evagrus, 95, 109
 Heligmomerus, 63, 78
 caffra, Ximenia, 125
 caffrum, Erythroxylon, 128
 cajanifolia, Pleiospora, 127
 Cajanus, 11
 calanthoides, Eulophia, 124
 calomelanos, Ceropteris, 121
 Pellaea, 121
 Calostephane, 135
 Camara, Lantana, 133
 CAMPANULACEAE, 134
 CANELLACEAE, 131
 canescens, Cineraria, 135
 canoargentea, Lasiosiphon, 131
 capense, Blechnum, 120
 Xanthoxylon, 128
 capensis, Adiantopsis, 121
 Cheilanthes, 121
 Cissus, 130
 Ctenomeria, 130
 Eptesicus, 113
 Euplectes, 117
 Fagara, 128
 Fleurya, 124
 Hemitelia, 120
 Plumbago, 41
 Trachypogon polymorphus, 121
 caperonioides, Acalypha, 129
 capitata, Hembstaetia, 125
 Jacquemontia, 132
 capnias, Parectopa, 40
 CAPPARIDACEAE, 126
 Capparis, 126
cardinata, Cholotis, 28
 cardiophora, Disperis, 124
 Carduus, 135
 carnosa, Huernia, 132
 Carposina, 8
 CARPOSINIDAE, 8
 Carteri, Eretmocera, 35
caryocoma, Argyroploce, 11
 CARYOPHYLLACEAE, 125
 Cassia, 127
 castaneus, Stasimopus, 94
 cathartica, Bridelia, 129
catopteron, Nephrodium, 120
 caulescens, Dimorphotheca, 135
caulota, Labdia, 27
 CAVICORNIA, 111
 cepapi, Paraxerus, 112
 Cephalaria, 134
Cerantes, 33
 Cerastium, 125
 Ceratogyrus, 63, 103
 cereziiforme, Monocymbium, 121

 Ceromitia, 47, 59
 Ceropegia, 132
 Ceropteris, 121
certa, Oinophila, 57
certificata, Sapheneutis, 45
 Ceterach, 120
 Chaetachme, 124
Cheilanthes, 121
 Chelaria, 21, 22
 chilocalyx, Cleome, 126
 Chirocompa, 30
 Chloropeta, 1
Chloropetella, 1
chlorotoma, Leuronoma, 16
 Onebala, 25
 Cholotis, 28
 chrysocarpus, *Rubus rigidis*, 126
 Chrysochloris, 113
 cicutarium, *Aspidium*, 120
 ciliata, *Acalypha*, 129
 ciliolata, *Peperomia retusa*, 124
 Cineraria, 135
 cineria, *Vernonia*, 134
circumjunctum, Galeosoma vandami,
 63, 78 (Text-fig. 4c), 80; Pl. IV,
 figs. f, g
 cirrhocoma, *Anacampsis*, 20
 Cissus, 130
 Cistugo, 112
 citri, Prays, 56
 Citrus, 56
 civetta, *Viverra*, 112
Cladophantis, 33
 Clarkei, *Blepharis*, 133
 clavigera, *Euphorbia*, 129
 Cleome, 126
 Cloeotis, 112
 Cluytia, 129
 Cnephasia, 9
 Cnetis, 128
 Coccolus, 126
 coeagensis, Moggridgea, 107
 COLEOPHORIDAE, 38
 coloratus, *Sporobolus pectinatus*, 122
 combreticola, *Viscum*, 124
 Commiphora, 128
 comosa, *Alepidea*, 132
 Hermannia, 131
 compacta, *Depressaria*, 31
 COMPOSITAE, 134
concinna, Davallia, 120
conclusa, Trichotaphe, 23
 concolor, *Doryopteris*, 121
confixa, Telphusa, 51
 conjuncta, *Muraltia*, 129
 CONNARACEAE, 128
 Conrathii, *Senecio*, 135
conservata, Protomacha, 31
consobrina, Pellaea, 121
 constrictos, *Pterinochilus*, 102 ftm.
convallata, Myrmecozela, 57

- CONVULVULACEAE, 132
 Conyza, 134
 Cooperi, Crassula, 126
 Ranunculus, 126
 COPROMORPHIDAE, 35
 Corallocarpus, 134
 Corchorus, 130
cordata, *Gymnogramme*, 120
cordatum, Ceterach, 120
cordifolium, Schizoglossum, 132
 Coreopsis, 135
 Coriacea, Rhus, 130
 coronata, Numida mitrata, 3
 coronatum, Galeosoma, 78 (Text-fig. 4e),
 81, 82, 83; Pl. IV, fig. a
corroborata, *Tortrix*, 8
corrugata, *Gracilaria*, 40
 COSMOPTERYGIDAE, 27, 52
costatum, Thesium, 125
 Cotyledon, 126
cousinioides, Berkheya, 135
 Crabbea, 133
crassispina, Pterinochilus, 100, 102
 Crassula, 126
 CRASSULACEAE, 119, 126
crataegifolia, Vernonia, 134
crateraula, *Pycnostola*, 14
cregoei, Acanthodon, 75
crenata, Dryopteris, 120
crenatum, *Nephrodium*, 120
crinitum, *Galeosoma robertsi*, 63, 82;
 Pl. IV, fig. b
crispula, Harveya, 133
 Crithagra, 116
 Crobylophora, 41
 Crocidura, 112
 Crossandra, 133
 Crotalaria, 127
 Croton, 129
 CRUCIFERAE, 126
crudeni, Acanthodon, 72, 76, 77
 Pelmatorycter, 108
Crypsithyris, 43, 57
crypsixantha, *Nepticula*, 43
 Cryptillas, 116
 CTENIZIDAE, 107 ftn., 111
Ctenolophus, 75, 110
Ctenomeria, 130
cuculans, *Odites*, 54
 Cucumis, 134
 CUCURBITACEAE, 134
culveri, Disa, 124
curvipes, *Spiroctenus*, 63, 88, 89 (Text-
 figs. 8a-c); Pl. III, figs. d-e
cyanea, Crocidura, 112
cyanoscia, *Zesticodes*, 46
 CYATHEACEAE, 120
cymatias, *Microschismus*, 35
Cymbopogon, 121
 CYPERACEAE, 122
 Cyphia, 134
Cyphothyris, 32
cyprophanes, *Daemonarcha*, 27
Cyrtomium, 120
Cystopteris, 120
cytisoides, *Thesium*, 125
Daemonarcha, 27
Dalbergia, 128
Dalechampia, 130
Damarchodes, 109
damarensis, *Numida papillosa*, 2, 3
daricella, Crobylophora, 41
darlingi, Ceratogyris, 103
 Rhinolophus, 112
Davalia, 132
Davallia, 120
Davyae, Musa, 123
Davyana, Aloe, 122
Davyi, Fagara, 128
decachrysa, *Glyphipteryx*, 36
Decadarchis, 43
decurrens, *Chirocompa*, 30
deltophanes, *Porthmologa*, 53
densiflora, Dombeya, 131
dentata, Pteris, 121
dentatus, Senecio Johannesburgensis, 135
denticulata, Streptocarpus, 133
depauperata, Nidorella, 134
depressa, Selaginella, 121
Depressaria, 31
depressinervia, Acalypha, 129
derogatella, Eretmocera, 35
deserti, Sansevieria, 122
desiensi, *Eucosma*, 10
Desmodium, 128
diagonalis, Digitaria, 121
Dianthus, 125
dichiloides, Lotononis, 127
Dichomeris, 23
Dichondra, 132
dichotoma, Gleichenia, 120
dichotomum, Viscum, 124
Dichrocephala, 134
Dicliptera, 133
Digitaria, 121
Dimorphotheca, 135
Dinteri, Crotalaria squarrosa, 127
 Ficus, 124
Diocosma, 33
diocus, Scirpus, 122
Diores, 63, 105
Dioscorea, 123
 DIOSCOREACEAE, 123
diplopsamma, *Sapheneutis*, 45
 DIPLOTHELEAE, 107 ftn.
 DIPLURIDAE, 107 ftn.
 DIPSACEAE, 134
Disa, 124
discolor, *Stephania*, 126
discoporus, *Sporobolus*, 122
Disperis, 124

- Disperma, 133
 dissectus, *Cucumis hirsutus*, 134
 Dissotis, 131
 distans, *Crotalaria*, 127
 divaricata, *Calostephane*, 135
 Raphionacme, 132
 diversifolius, *Hibiscus*, 130
dolichocephalus, Ceratogyrus, 63,
 104; Pl. I, fig. *d*; Pl. II, fig. *a*
 Dombeya, 131
 dorsistrigata, *Eretmocera*, 35
 Doryopteris, 121
 Dragmatucha, 24, 25
drastica, Eucosma, 49
 dregeana, *Dioscorea*, 123
 Thunbergia, 133
 Vernonia, 134
 dregeanum, *Cerastium*, 125
 Desmodium, 128
 dreyeri, *Stasimopus*, 93
drimyloa, Apotactis, 52
dryadopa, Brachmia, 25
 Dryodromas, 117
 Dryopteris, 120
 dubia, *Leptopelma*, 97
 dura, *Pellaea*, 121
 Dyschoriste, 133

 Ecbolium, 133
 Eclipta, 135
 edouardi, *Gutтера*, 3
effulgens, Limnoecia, 27
effusum, Sorghum halepense, 121
egens, Blastobasis, 37
 Elachista, 55, 56
 ELACHISTIDAE, 55
elaecoma, Anacamopsis, 19
 Elaeophorbia, 129
 Elaphoglossum, 121
 ELATINACEAE, 131
 elatus, *Gladiolus varius*, 123
 elongata, *Dryopteris*, 120
elongatum, Nephrodium Filix-Mas, 120
 elongatus, *Felicia*, 134
embolaea, Hemimene, 51
 empetroides, *Muraltia*, 129
encharacta, Argyroploce, 50
 enormis, *Euphorbia*, 129
eodryas, Acompsia, 20
eutrocha, Diocosma, 33
 epapposum, *Helichrysum*, 134
 EPERMENIADAE, 56
 Ehippias, 11
 epicoena, *Proterochyta*, 56
 epicyparissias, *Euphorbia*, 129
 Epimys, 112
 EpiphRACTIS, 53
 Epithecis, 16
 Eptesicus, 113
 Eragrostis, 122
erebaulta, Pycnodytis, 15
 erecta, *Eclipta*, 135
erectum, Asplenium, 120
 Eretmocera, 35
 Eriochrysis, 121
 eriophorum, *Helichrysum*, 134
 Erlangea, 134
 ermelensis, *Disperis*, 124
 Erotis, 33
erythropa, Argyroploce, 11
 Erythrorrhizum, *Anthericum*, 122
 ERYTHROXYLACEAE, 128
 Erythroxyton, 128
 Ethelae, *Kaempferia*, 123
 Ethmia, 37
 Eucosma, 9, 48
 EUCOSMIDAE, 9, 48, 51
 Eucryptogona, 45
 Eugenia, 131
 Eulalia, 121
 Eulophia, 124
 Euphorbia, 129
 EUPHORBIACEAE, 119, 129
 Euplectes, 117
euplocamis, Tinea, 44
euryacta, Lysitona, 57
euryzancla, Oxymachaeris, 43
 Euxanthis, 8
 Evagrus, 63, 95, 109
 Evansii, *Euphorbia*, 129
excoriata, Laspeyresia, 13
exhilarata, Argyroploce, 50
exoenota, Gelechia, 52
 explicata, *Digitaria monodactyla*, 121
exsanguis, Carposina, 8
exsulata, Anacamopsis, 20
extensa, Blastobasis, 55

 Fagara, 128
 falcatum, *Aspidium*, 120
 Cyrtomium, 120
 Farm Goede Hoop, *Geranium incanum*,
 128
fecunda, Gelechia, 17
 Felicia, 134
 ferox, *Acacia*, 127
ferulata, Parapsectris, 17
 ficifolia, *Pueraria*, 128
 Rhynchosia, 128
 Ficus, 124
 filamentosa, *Crassula*, 126
 filifolia, *Lotononis*, 127
 Pearsonia, 127
filiformis, Rhus, 130
fiscinata, Brachmia, 26
fiabellata, Pteris, 121
 FLACOURTIACEAE, 131
 flaveolum, *Acanthodon*, 77 and ftn., 107
flavisecta, Cnephasia, 9
 flavivittus, *Heliosciurus*, 112
 flavopunctatus, *Hermachastes*, 107
 Fleurya, 124

- floccosum, *Helichrysum*, 134
 floribunda, *Tricalysia*, 133
 floribundum, *Thesium*, 125
 Fluggea, 129
 foliosa, *Habenaria*, 123
Forskali, *Themeda*, 121
 fossoria, *Bessia*, 86
 fragilis, *Cissus*, 130
 Cystopteris, 120
 fulvicapilla, *Dryodromas*, 117
 Fumaria, 126
 fumaroides, *Hymenophyllum*, 120
 Fumea, 45, 59
furcatum, *Asplenium*, 120
 fuscipennis, *Eretmocera*, 35
- Galeosoma, 63, 78
 Galpini, *Acalypha caperonioides*, 129
 Euphorbia, 129
 Habenaria, 123
 Galpinii, *Ficus*, 124
 Loranthus, 124
 garcianus, *Loranthus*, 124
 Gardenia, 133
 Geigeria, 135
 Gelechia, 17, 18, 52
 GELECHIADAE, 13, 51
 geoffroyi, *Rhinolophus*, 112
geomicta, *Phthorimaea*, 18
 Georychus, 5
 GERANIACEAE, 128
geraniaefolis, *Pellaea*, 121
 Geranium, 128
 Gerbera, 135
 Gerdana, 32
 Gerrardi, *Schizochilus*, 123
 GESNERACEAE, 133
 Gettleffii, *Stapelia*, 132
 Giesekia, 125
 glabra, *Amphilophis*, 121
 Vernonia, 134
 glabrata, *Acalypha*, 130
 Leucas, 133
 glabrescens, *Nesaea sagittifolia*, 131
 glabricarpellata, *Knowltonia*, 125
glabriflorus, *Loranthus*, 124
 Gladiolus, 123
glandifera, *Ethmia*, 37
 glandulifera, *Wormskioldia*, 131
 glauca, *Adenia*, 131
 glaucella, *Euphorbia*, 129
 Gleichenia, 120
 GLEICHENIACEAE, 120
 globuligemma, *Aloe*, 122
 glomeratum, *Limeum*, 125
glyphicodes, *Eucosma*, 10
 GLYPHIPTERYGIDAE, 36, 55
 Glyphipteryx, 36
 Gnidia, 131
godfreyi, *Diores*, 63, 105, 106 (Text-
 figs. 13a-c)
- goetzeanum, *Thesium*, 125
 gongyloides, *Dryopteris*, 120
Gorgyrella, 75, 110, 111
 Goudotii, *Pellaea*, 121
 Gracilaria, 40
 GRACILARIADAE, 39
 gracilarioides, *Thesium*, 125
 gracile, *Asplenium lunulatum*, 120
 gracilior, *Pleiospora*, 127
gracilipes, *Acanthodon*, 63, 68, 75
 gracilirostris, *Lusciniola*, 116
 gracilis, *Juncus*, 122
 gracillima, *Rhus*, 130
 Wahlenbergia, 134
 gracillimus, *Podocarpus*, 121
 grahami, *Epimys namaquensis*, 112
 GRAMINEAE, 121
 grandiflora, *Tavaresia Barklyi*, 132
 grandis, *Mungos*, 112
 grantiana, *Crotalaria*, 127
gratiosa, *Simaethis*, 55
gratissimus, *Croton*, 129
 Grewia, 130
 griquensium, *Scirpus*, 122
 grisea, *Hermannia*, 131
 grosseserrata, *Hermannia*, 131
 Gubouga, *Croton*, 129
 Gueinzii, *Euphorbia*, 129
 Guilleminea, 125
 guineense, *Erythrophloem*, 127
 guineensis, *Sansevieria*, 122
gurneyi, *Proctopus nigricollis*, 118
 Guttera, 3
 Gymnogramma, 38
 Gymnogramme, 120, 121
 gypsophiloides, *Thesium*, 125
- haagneri**, *Platymops*, 5
 Habenaria, 123
 HALORHAGIDACEAE, 132
 hamatum, *Mesembrianthemum*, 125
 Hapsifera, 46, 58
 Harpactirella, 96, 97
 harpalea, *Opogona*, 56
 Harveya, 133
 harveyana, *Vitex*, 133
 hastata, *Pellaea*, 121
 Heeria, 130
 Helichrysum, 134
 Heligomerus, 63, 78
 HELIODINIDAE, 35
 Heliosciurus, 112
 Heliotropium, 132
 HELIOZELIDAE, 35
helminthias, *Schiffermuelleria*, 29
 Hemimene, 51
 Hemitelia, 120
 hemizona, *Leucoptera*, 41
hepburni, *Acanthodon*, 63, 73, 77
 Hermacha, 109
 Hermachastes, 107

- Hermania, 131
 Hermbstaedtia, 125
Hesperarcha, 38
 heteracantha, Acacia, 127
 Hexalobus, 126
 Hibiscus, 130
 Hippocratea, 130
 HIPOCRATEACEAE, 130
 hirsuta, Cluytia, 129
 hirsutissima, Lotononis calycina, 127
 hirsutum, Galeosoma, 79, 82
 Thesium, 125
hirsutus, Acanthodon, 63, 69, 75
 Corchorus, 130
 Gnidia fastigata, 131
 hirta, Euphorbia, 129
 Hyparrhenia, 121
 Mollugo, 125
 Nidorella, 134
hirtus, Cymbopogon, 121
 hispida, Polygala, 129
 hoepfnerianus, Lasiosiphon, 131
 holosericea, Cassia, 127
 Pleiospora, 127
holosticta, Ceromitia, 59
 Holothrix, 123
homogramma, Onebala, 25
 Homostola, 90, 108
 horizontalis, Digitaria, 121
horrida, Acacia, 126
hortulana, Trichotaphe, 23
hostilis, Polyhymno, 19
 Huernia, 132
 humilior, Lotononis, 127
Hyalochna, 30
 HYDROCHARITACEAE, 121
 Hygrophila, 133
 HYMENOPHYLLACEAE, 120
 Hymenophyllum, 120
 Hyparrhenia, 121
 hypericifolia, Euphorbia, 129
 Hypolepis, 121
 hypoleuca, Sanguisorba, 126
 HYPONOMEUTIDAE, 37, 56
hysterota, Platybathra, 38

idiocoma, Opostega, 42
 Idioglossa, 56
 IDIOPEAE, 111
 Idiops, 110, 111
Idiothele, 63, 96
 illecebrioides, Guilleminea, 125
 illuminata, Pycnostola, 15
 imberris, Sisyranthus, 132
 inaeoena, Eulophia, 124
 inaequalis, Crassula, 126
 Dryopteris, 120
 inaequilatera, Euphorbia, 129
 incana, Rhus, 130
 incanum, Geranium, 128
 Polypodium, 121
 incisifolia, Tragia, 130
 inclusus, Gladiolus, 123
incolumis, Odites, 54
 incurva, Habenaria, 123
 Indigofera, 128
 ingens, Euphorbia, 129
 Ficus, 124
 inscita, Eucosma, 9
 insculpta, Amphiplophus, 121
insolita, Crypsithyris, 57
intorta, Polyhymno, 19
involutrata, Euphorbia, 129
iocharis, Trachydora, 28
 Ipomoea, 132
 IRIDACEAE, 123
 irroratus, Otomys, 115
 Isachne, Brachyaria, 122
 Panicum, 122
 isatideus, Senecio, 135
 Ischnothele, 96

 Jacobsziae, Alepidea, 132
 Jacquemontia, 132
 Jasminum, 132
 Jatropha, 129
 Jenkinsii, Alepidea, 132
 JUNCACEAE, 122
 Juncus, 122
 junodi, Pterinochilus, 102 ftn.
 Junodiana, Brachycorythis, 123
 Junodii, Kalanchoe, 126
 Thesium, 125

 Kaempferia, 123
 kalachariensis, Loranthus, 124
 Kalanchoe, 126
 Karroo, Acacia, 126
 karschi, Ischnothele, 96
 kentanicus, Acanthodon, 68, 69
 Kirkii, Dalechampia, 130
 Loranthus, 124
 Kniphofia, 122
 Knowltonia, 125
 komatiensis, Rhynchosia, 128
kraussiana, Acacia arabica, 126
 Kraussiana, Euphorbia, 129
kraussianus, Loranthus, 124

 Labdia, 27, 52
 labialis, Tetramnus, 128
 LABIATAE, 133
Lachnostola, 22
lacunosa, Epitheatia, 16
 laeta, Disa, 124
 Lagerosiphon, 121
 laminatus, Otomys, 114, 115
laminicornis, Blossia, 63, 65, 66 (Text-
 figs. 2a-c)
lamprostola, Monopis, 43
 lanceolata, Crotalaria, 127
 Gymnogramme, 121

- lanceolata, *Lotononis*, 127
 Lantana, 133
 lanuginosa, *Dryopteris*, 120
 Lasiosiphon, 131
 Lasiospermum, 135
 Laspeyresia, 12, 51
 latebracteolata, *Pleiospora*, 127
laticosta, *Blossia*, 63, 64 (Text-figs. 1 a-c)
 latifolia, *Acalypha glabrata*, 130
 Anaglypha, 134
 Ceropegia multiflora, 132
 Dichrocephala, 134
 latifolium, *Elaphoglossum conforme*, 121
 latipetala, *Eulophia*, 124
 latissimifolius, *Senecio*, 135
 laxa, *Cluytia*, 129
 Lecithocera, 34
 ledereiella, *Batrachedra*, 28
 Leendertziae, *Loranthus olaefolius*, 124
 LEGUMINOSAE, 11, 119, 126
 Leptopelma, 97
 Lessertia, 128
lesueuri, *Cistugo*, 112
 Leucas, 133
leucatoma, *Brenthia*, 36
 Leucoptera, 40
 leucoptera, *Crithagra*, 116
Leuronoma, 16
 LILIACEAE, 122
 Limeum, 125
 Limnoecia, 27
 linearis, *Gleichenia*, 120
 linoides, *Gnidia*, 131
 Lissochilus, 124
 lividicollis, *Guttera*, 3
lobatum, *Asplenium erectum*, 120
lobostola, *Eucosma*, 49
Lomaria, 120
 lomatophyllus, *Juncus*, 122
londinensis, *Spiroctenus*, 63, 86, 87
 (Text-figs. 7 a-b), 107
 longeciliata, *Alepidea*, 132
 longibracteata, *Aloe*, 122
 longiflora, *Digitaria*, 121
 Thorncroftia, 133
 longifolia, *Acalypha punctata*, 130
 longifolium, *Argyrolobium*, 127
 Lopholaena, 135
 LORANTHACEAE, 119, 124
Loranthus, 124
Lotononis, 119, 127
 Lotus, 128
 loxogramme, *Polypodium*, 121
loxosaris, *Chelaria*, 21
 luctuosum, *Polystichum*, 120
 lugardae, *Commiphora*, 128
 Monadenium, 129
 Lugardii, *Sesamothamnus*, 133
 lunariifolius, *Hibiscus*, 130
 lunifera, *Eretmocera*, 35
 lunulatum, *Asplenium*, 120
 Lusciniola, 116
 lutea, *Felicia*, 134
luticoma, *Fumea*, 59
lydenbergensis, *Monodenia*, 124
 LYONETIADAE, 40, 42, 56
lyrata, *Cineraria*, 135
Lysitona, 57
 LYTHRACEAE, 131

 MacLeaii, *Aspidium*, 120
 Polystichum, 120
macowanii, *Hermannia*, 131
macrobelia, *Labdia*, 52
macrochilus, *Pachycarpus*, 132
macrophylla, *Oldenlandia*, 133
 Pleiospora, 127
macrophyllus, *Senecio*, 135
macropoda, *Tephrosia*, 128
macrorhynchus, *Euplectes capensis*, 117
Maerua, 126
magaliesmontanus, *Gladiolus*, 123
magalismontana, *Rhus*, 130
magalismontanum, *Thesium*, 125
magna, *Harpactirella*, 97
magnusiana, *Ipomoea*, 132
major, *Lagerosiphon muscoides*, 121
mallotocarpa, *Ficus*, 124
 MALVACEAE, 130
marginata, *Lotononis*, 127
 Pearsonia, 127
marginatus, *Gladiolus*, 123
maritimus, *Mungos pulverulentus*, 114
Markhamia, 133
Marleyi, *Spiroctenus*, 63, 83 (Text-fig. 5)
Marlothii, *Hymenophyllum*, 120
 Lotononis, 127
marshalli, *Ceratogyryrus*, 104
Marshallii, *Aloe*, 122
Marsilia, 121
 MARSILIACEAE, 121
Matricaria, 135
mauritanica, *Dryopteris*, 120
maxillaris, *Crotalaria*, 127
melanaula, *Eucosma*, 11
melanogastra, *Cholotis*, 28
melanoleuca, *Zantedeschia*, 122
melanostola, *Phrixosceles*, 39
melanoxylon, *Dalbergia*, 128
Melasina, 45
 MELASTOMACEAE, 131
melckorum, *Eptesicus*, 113
Melhania, 131
 MELIACEAE, 128
 MELIANTHACEAE, 130
melitardis, *Opostega*, 41
Melolobium, 127
Melothria, 134

- MENISPERMACEAE, 126
merista, Pycnostola, 14
 Merremia, 132
 Mesembrianthemum, 125
mesochlora, Talaeporia, 44
 mespilifolia, Vernonia, 134
 METACHANDIDAE, 27
metapyrrha, Tortrix, 8
 microcarpa, Chaetachme, 124
 Fluggea, 129
 Microcolona, 53
 Microlepidia, 120
 MICROLEPIDOPTERA, 7, 48
 micropetalus, Dianthus, 125
 microps, Acanthodon, 69, 75, 111
 Microschismus, 35
 MIGIDAE, 107 ftm.
 miniata, Eretmocera, 35
minor, Acanthodon schreineri, 76, 111
 Bessia, 86, 88
 Chrysochloris, 113
 Spiroctenus, 87 (Text-fig. 7c)
 Stasimopus, 93
 minus, Thalictrum, 126
 minuscula, Decadarchis, 43
 Mirafrata, 117
 mitrata, Numida mitrata, 3
 Moggridgea, 107
 molle, *Nephrodium*, 120
 mollis, Bridelia, 129
 Dryopteris, 120
 Mollugo, 125
 Monactinocephalus, 134
 Monadenium, 129
 Monechma, 133
 Monocymbium, 121
 Monodenia, 124
 Monopis, 43
 montana, Brachymeris, 135
 montanum, Trichomanes, 120
 Monteiroi, Crotalaria, 127
 monticola, Acanthodon, 67, 76
 Cluytia, 129
monticoloides, Acanthodon, 63, 67, 76
 Moorei, Loranthus, 124
 MORACEAE, 124
mossambicum, Galeosoma, 63, 78
 (Text-figs. 4a-b)
mossambicus, Acanthodon, 63, 72, 73,
 76
 Mucuna, 128
 Muddii, Argyrolobium, 127
 multiflora, Adenia, 131
 Lotononis, 127
 Lotononis laxa, 127
 Matricaria, 135
 Pearsonia, 127
 Wahlenbergia, 134
 Mundtii, Bupleurum, 132
 Fumaria, 126
 Scolopia, 131
 Mungos, 112, 114
munroanum, Saccharum, 121
 Muraltia, 129
 muricata, Sanguisorba, 126
 Musa, 123
 MUSACEAE, 123
 Myotis, 112
 myriacantha, Aloe, 122
 Myrmecozela, 57
 MYRTACEAE, 131
 namaquensis, Blossia, 65
 Loranthus, 124
 natalense, Aponogeton, 121
 Thesium, 125
 natalensis, Cadaba, 126
 Chloropeta, 2
 Cnetis, 128
 Euphorbia, 129
 Georychus, 6
 Gerbera, 135
 Spermacoce, 134
 Toddalia, 128
 Tragia, 130
 Ursinia, 135
 natalitia, Crotalaria, 127
 natalitium, Desmodium, 128
 natans (obovata), Crassula, 126
 Nationae, Thesium, 125
Nebolusia, 123
 Nelsoni, Brownleea, 123
 Disa, 124
 Eulophia, 124
 Nelsonii, Disperis, 124
 neopolycnemoides, Euphorbia, 129
neoxesta, Depressaria, 31
Nephrodium, 120
 Nepticula, 43
 NEPTICULIDAE, 43
neritis, Phyciodyta, 58
 Nesaea, 131
 Nidorella, 134
 nigellaefolia, Matricaria, 135
 nigellus, Stasimopus, 63, 93
 nigra, Hermacha, 109
 Moggridgea, 107
nigrispersa, Scythris, 37
 nigrofulvus, Idiothele, 63, 98, 100 (Text-
 fig. 11), 101 (Text-fig. 12a), 102; Pl.
 II, fig. b
 Pterinochilus, 98
 nigropedata, Brachiaria, 122
nigropedatum, Panicum, 122
nigropilosus, Acanthodon, 63, 70, 71
 (Text-figs. 3a-b), 72, 77
 nilotica, Turraea, 128
 nimbifera, Symphoristis, 55
 niveocervina, Oxymachaeris, 43
 nodiflorum, Solanum, 133
 Nothris, 22
nubeculosa, Odites, 54

nubica, Tephrosia, 128
 nubigenum, Mesembrianthemum, 125
 nudiuscula, Roripa, 126
 nudus, Pelmatorycter, 91, 92
 Numida, 2
 Nyctinomus, 4

obelacma, Leucoptera, 41

obovata, Crassula natans, 126
 Pleiospora, 127

obscurum, Panicum, 121

obsepta, Dragmatucha, 24

obtusifolia, Hippocratea, 130
 Turraea, 128

ochraula, Pycnostola, 14

ochreolum, Acanthodon, 76

ochrozona, Orneodes, 35

octophora, Brachmia, 25

Odina, 130

Odites, 54

OECOPHORIDAE, 29, 53

Oinophila, 57

OLACACEAE, 125

olaefolius, Loranthus, 124

Oldenlandia, 133

OLEACEAE, 132

ominosa, Fumea, 45

Ommannei, Senecio, 135

Onebala, 25

onychotis, Crobylophora, 41

Opogona, 56

Opostega, 41

Opsigenes, 30

opsonoma, Eucosma, 48

orangana, Habeneria, 123

ORCHIDACEAE, 123

Orneodes, 34, 55

ORNEODIDAE, 34, 55

orthobathra, Depressaria, 31

Otomys, 114

ovalifolia, Gnidia, 131

ovata, Brachycorythis, 123

Plantanthera, 123

Oxymachaeris, 42

oxymoris, Oinophila, 57

oxyriaefolius, Senecio, 135

Pachycarpus, 132

pachydesma, Cnephasia, 9

pachypoda, Brassica, 126

Pachystigma, 134

palki, Georychus, 5

pallida, Eriochrysis, 121

pallidum, Galeosoma, 79

palliolum, Thesium, 125

palmata, Ipomoea, 132

Paltodora, 13

Pancratium, 122

panduraefolius, Senecio, 135

paniculata, Phyllica, 130

Pleiospora, 127

paniculatus, Monactinocephalus, 134

Panicum, 121, 122

pantomima, Microcolona, 53

PAPAVERACEAE, 126

papillosa, Eulophia, 124

Numida, 2, 3

paracma, Polyhymno, 19

Parapsectris, 17

parastacta, Opsigenes, 30

Paraxerus, 112

pardalina, Paromostola, 84

Parectopa, 39

Paromostola, 84

parviflora, Davalia transvaalensis, 132

parvus, Pelmatorycter, 108

PASSIFLORACEAE, 131

patersonae, Stasimopus, 95

Pavetta, 134

Pearsonia, 119, 127

pectinata, Crassula, 126

Schizaea, 120

pectiniformis, Pellaea, 121

pectinipalpis, Acanthodon, 73, 76

PEDALIACEAE, 133

pedicata, Schiffermuelleria, 29

peduncularis, Fleurya, 124

pedunculata, Crabbea, 133

Giesekia pharnaceoides, 125

Pegolettia, 134

Pelargonium, 128

Pellaea, 121

Pelmatorycter, 63, 91, 108, 109

pendens, Phthorimaea, 18

Pennisetum, 122

pentadecandra, Giesekia, 125

pentandra, Pharnaceum, 125

pentasticta, Aulotropha, 32

Pentatricha, 134

pentrandrum, Trianthes, 125

Pentzia, 135

Peperomia, 124

peploides, Crassula, 126

percivali, Cloeotis, 112

perfoliata, Arabis, 126

pericentra, Hesperarcha, 38

personatus, Spiroctenus, 88, 90

Petersii, Ficus, 124

petiolatum, Elaphoglossum, 121

petricola, Aloe, 122

petrophilus, Platymops, 4, 5

Phaenohoffmannia, 127

phaeocephala, Tineola, 44

PHALONIADAE, 8

Pharnaceum, 125

Phaseolus, 11

photaula, Orneodes, 55

Photodotis, 15

Phrixosceles, 39

Phthorimaea, 18, 19

Phyciodyta, 58

Phyllica, 130

- Phyllanthus, 130
PHYTOLACCACEAE, 125
 Pienarii, Aloe, 122
 pilifera, Matricaria, 135
 pilosa, Acalypha glabrata, 130
 pilosum, Galeosoma, 79
pilulifera, Euphorbia, 129
 pinifolia, Gnidia, 131
 Vernonia, 134
 pinnata, Merremia, 132
 pinnatifida, Conyza, 134
 pinnatifidum, Ceterach cordatum, 120
 pinnulatus, Senecio, 135
PIPERACEAE, 124
planiscutatum, Galeosoma, 63, 78, 79
 (Text-fig. 4 d), 80
Platanthera, 123
 Platybathra, 38
 Platymops, 4
 platyneuron, Asplenium, 120
 Platyptilia, 7
 Plectranthus, 133
 Pleiospora, 127
 plicatus, Pachycarpus, 132
 Plukenetia, 130
 Plumbago, 41
 plumosa, Eragrostis tenella, 122
 plumosus, Trachypogon, 121
pluridentatum, Idiothele, 63, 101
 (Text-fig. 12 b)
pluripunctatum, Galeosoma, 63, 81;
 Pl. IV, fig. d
 podalyriaefolia, Pearsonia, 127
 Podocarpus, 121
 polita, Davalia, 132
Pollinia, 121
 polyacantha, Berkheya, 135
 polycephalus, Arthrosolen, 131
 Polychrosis, 11
 Polygala, 129
POLYGALACEAE, 129
 Polyhymno, 19
polyphylla, Habenaria, 123
 polypodantha, Habenaria, 123
POLYPODIACEAE, 120
 polypodioides, Polypodium, 121
 Polypodium, 120, 121
 polystachya, Lessertia, 128
 Lessertia perennans, 128
polystacta, Scardia, 47
 Polystichum, 120
 Porthmologa, 53
praecipua, Bucculatrix, 42
 praemorsum, Asplenium, 120
praestriata, Parectopa, 39
 Prays, 56
 pretoriensis, Aloe, 122
 Gladiolus, 123
 primulina, Vernonia, 134
 princeps, Dissotis, 131
 Proceleustis, 54
 Proctopus, 118
 prolifera, Dryopteris, 120
proliferum, Polypodium, 120
 Promalactis, 29
 propinqua, Pearsonia, 127
propitia, Argyroploce, 12
 prostrata, Melhania, 131
Proterochyta, 56
 Protomacha, 31
 pseudoglandulifera, Jatropha, 129
 Psiadia, 134
 Psilotrichum, 125
 Psoralea, 128
 Pteridium, 121
 Pterinochilus, 63, 97, 98, 100, 102, 104
 Pteris, 121
 pteroides, Pellaea, 121
PTEROPHORIDAE, 7
ptychospila, Symphoristis, 55, 56
 pubescens, Brachycorythis, 123
 pubiflorum, Schizoglossum robustum,
 132
 Pueraria, 128
 pulcherrima, Heeria, 130
 pulchra, Disa, 124
 Lotononis, 127
 pulverulentus, Mungos, 114
 punctata, Acalypha, 130
 Sesbania, 128
punctatus, Andropogon intermedius, 121
 Spiroctenus, 90
 punctulatum, Blechnum, 120
 pungens, *Aspidium aculeatum*, 120
 Polystichum, 120
 Pupalia, 125
 purcelli, Damarchodes, 109
 purpurascens, Ischaemum, 121
 purpureo-auratus, Gladiolus, 123
 purpureo-sericeum, Sorghum, 121
purpureo-sericeus, Andropogon, 121
 pusilla, Eugenia, 131
pusillum, Trichomanes, 120
 pycnocephalus, Carduus, 135
 Pycnodytis, 15
 Pycnostola, 13
 pygmaea, Pachystigma, 134
 Vangueria, 134
pyramidota, Acrocercops, 39

quadriaurita, Pteris, 121
 quadripinnata, Pellaea, 121
 quinquenervis, Loranthus, 124
 quinquepartita, Trochomeria Hookeri, 134

racemosa, Gymnogramma, 38
 radiatum, Lasiospermum, 135
 Randii, Vernonia, 134
RANUNCULACEAE, 125
 Ranunculus, 126
 Raphanocarpus, 134
 Raphionacme, 132

- rarum*, Hymenophyllum, 120
rasum, Thesium impeditum, 125
 Reckii, Holothrix, 123
 Recurvaria, 20
regularis, Brachiaria, 122
Rehmanni, Eulophia, 124
 Habenaria, 123
 Polygala, 129
 Schizochilus, 123
rehmanniana, Acacia, 127
Rehmannii, Berkheyopsis, 135
 Hygrophila, 133
 Lissochilus, 124
reniforme, Pelargonium, 128
repens, Dichondra, 132
 Serpicula, 132
resedoides, Thesium, 125
resiniflua, Gardenia, 133
resonans, **Ceromitia**, 47
reticens, Stenoma, 34
revoluta, **Gelechia**, 17
 RHAMNACEAE, 130
Rhinacanthus, 133
Rhinolophus, 112
rhomboideus, Senecio, 135
Rhus, 130
Rhynchosia, 128
rhytidophylla, Grewia, 130
rigens, *Polygala*, 129
rigida, *Maerua*, 126
rigidis, *Rubus*, 126
robertsi, *Galeosoma*, 82; Pl. IV, fig. b
Rogersiae, *Anisotes*, 133
Rogersii, *Acalypha punctata*, 130
 Cyphia, 134
 Dyschoriste, 133
 Lotononis, 127
 Pearsonia, 127
 Phyllanthus, 130
 Pueraria, 128
 Tragia, 130
Roripa, 126
 ROSACEAE, 126
rostrata, *Melhania*, 131
rotundifolia, *Dombeya*, 131
 RUBIACEAE, 133
rubromarginatus, *Loranthus*, 124
Rubus, 126
ruddi, *Mungos*, 114
Rudolphi, *Vitex mooiensis*, 133
rufa, *Hyparrhenia*, 121
rufescens, *Indigofera*, 128
rufus, *Cymbopogon*, 121
rugosella, *Hapsifera*, 59
Ruprechtii, *Cymbopogon*, 121
 Hyparrhenia, 121
 RUTACEAE, 128
rutaefolium, *Asplenium*, 120

Saccharum, 121
salicoma, **Melasina**, 45

salsuginosa, *Ammannia*, 131
Salvia, 133
Sandersonia, 122
sanguinea, *Euphorbia*, 129
Sanguisorba, 126
Sansevieria, 122
 SANTALACEAE, 125
Sapheneutis, 45
sarmentosa, *Kniphofia*, 122
Satyrum, 123
Sauromys, 5
saxicola, *Schistostephium*, 135
scaberrimus, *Corrallocarpus sphaerocarpus*, 134
Scabiosa, 134
scabiosoides, *Thelesperma*, 135
scalmotoma, **Promalactis**, 29
scandicinum, *Athyrium*, 120
Scardia, 47
Schiffermuelleria, 29
schinziana, *Ficus*, 124
Schinzii, *Acalypha*, 129
 Andropogon, 121
 Crotalaria, 127
 Crotalaria pilulicarpa, 127
Schistostephium, 135
Schizachyrium, 121
Schizaea, 120
 SCHIZAEACEAE, 120
Schizochilus, 123
Schizoglossum, 132
Schlechteri, *Adenia*, 131
 Crotalaria spinosa, 127
 Vernonia, 134
Schlechteriana, *Brachycorythis*, 123
schönlandi, *Pterinochilus*, 97
Stasimopus, 93, 94, 95
schreineri, *Acanthodon*, 111
 Galeosoma, 81; Pl. IV, fig. c
Scirpus, 122
Sclerophricta, 46
Scolopia, 131
 SCROPHULARIACEAE, 133
 SCYTHRIDAE, 37
Scythis, 37
seabrae, *Cistugo*, 112, 113
secularis, **Eucryptogona**, 45
secunda, *Rhynchosia*, 128
segetalis, *Acalypha*, 130
segmentata, *Lopholaena*, 135
Segregara, 111
Selaginella, 121
 SELAGINELLACEAE, 121
semiberbe, *Schizachyrium*, 121
semiberbis, *Andropogon hirtiflorus*, 121
semnophanes, **Gracilaria**, 40
Senecio, 135
senegalensis, *Hexalobus*, 126
 Pegolettia, 134
senensis, *Acalypha*, 130
sericea, *Eulalia*, 121

- sericea, *Lessertia perennans*, 128
 sericocephala, *Arthrosolen*, 131
 sericiflora, *Lotononis*, 127
 Serpicula, 132
 serrata, *Brachyaria*, 122
 Wormskioldia, 131
serratum, *Panicum*, 122
Sesamothamnus, 133
Sesamum, 133
Sesbania, 128
 sessiliflora, *Aloe*, 122
 sessiliflorus, *Anisotes*, 133
 sessilifolia, *Lotononis*, 127
 Pearsonia, 127
 seticoxa, *Moggridgea*, 107
 sexangularis, *Kalanchoe*, 126
silberbauer, *Dryodromas fulvicapilla*,
 117
silberbaueri, *Otomys*, 114
 silvatica, *Dryopteris*, 120
Simaethis, 55
Simii, *Aloe*, 122
 similis, *Lasiosiphon*, 131
 sinuato-dentata, *Ipomoea bathycolpos*,
 132
Sisyranthus, 132
Sisyraxena, 35
 SOLANACEAE, 133
Solanum, 133
 SOLIFUGAE, 63, 64
 solitudinis, *Lotononis*, 127
Sonderi, *Tragia*, 130
Sorghum, 121
 sparsisora, *Hypolepis*, 121
 spartifoliella, *Leucoptera*, 41
 spartioides, *Crotalaria*, 127
 Thesium, 125
 speciosa, *Gerbera*, 135
 speluncae, *Davallia*, 120
 Microlepia, 120
Spermacoe, 134
 sphaerocarpus, *Corrallocarpus*, 134
Sphenandra, 133
spheroideum, *Galeosoma coronatum*,
 63, 82; Pl. IV, fig. a
spicata, *Anarsia*, 21
spilodoma, *Photodotis*, 15
spinipalpis, *Spiroctenus* 63, 83, 84, 85
 (Text-figs. 6 a-b); Pl. III, fig. b
 spinipes, *Stasimopus*, 93, 94
 spiricola, *Acanthodon*, 73, 74, 77^f III
Spiroctenus, 63, 83, 107, 108, 109
spissa, *Crypsithyris*, 43
 splendens, *Asplenium cuneatum*, 120
sponditis, *Argyroploce*, 50
Sporobolus, 122
 stagninum, *Panicum*, 122
Stapelia, 132
Stasimopus, 63, 93, 108
 staterias, *Crobylophora*, 41
 stenantha, *Eulophia*, 124
 steneopteron, *Helichrysum*, 134
Stenoma, 34
 stenophylla, *Adenia*, 131
Stephania, 126
Stephia, *Coreopsis*, 135
Sterculia, 131
 STERCULIACEAE, 131
Stewartiae, *Eulophia*, 124
Stewartii, *Pearsonia multiflora*, 127
 stipella, *Aristotelia*, 15
 stipularis, *Bridelia*, 129
Streptocarpus, 133
Streptothyris, 32
 stricta, *Indigofera*, 128
 strictus, *Schizochilus*, 123
stromatias, *Dichomeris*, 23
suahelica, *Chloropetella*, 1
 subacaulis, *Crossandra*, 133
 subcoriaceus, *Senecio*, 135
subfulvescens, *Anarsia*, 21
 subgratissimus, *Croton*, 129
 subhastatus, *Corrallocarpus sphaerocar-*
 pus, 134
 subintegrifolia, *Trochomeria pectinata*,
 134
subulata, *Crassula*, 126
 subulifolium, *Panicum*, 122
 suffuticosa, *Bergia*, 131
 suprafoliata, *Aloe*, 122
 surattensis, *Hibiscus*, 130
Sutera, 133
 swaziensis, *Lotononis*, 127
 Pearsonia, 127
 sylvaticus, *Croton*, 129
symonsi, *Guttera edouardi*, 3
Symphoristis, 55
 syncentra, *Sisyraxena*, 35
Syrmadaula, 26
 tabulare, *Blechnum*, 120
Tacazzea, 132
Talaeporia, 44
tanyacta, *Streptothyris*, 32
Tavaresia, 132
 TAXACEAE, 121
Telphusa, 16, 51
Tephrosia, 128
Teramnus, 128
 ternatus, *Hibiscus*, 130
tesserata, *Orneodes*, 34
tetraleuca, *Gelechia*, 18
 tetraptera, *Sesbania*, 128
thalameuta, *Eucosma*, 49
Thalictrum, 126
Thamnosma, 128
 theciferum, *Asplenium*, 120
Thelechoris, 95, 96, 109
Thelesperma, 135
 thelypteris, *Dryopteris*, 120
 Nephrodium, 120
thematica, *Eucosma*, 48

- Themedra, 121
 THERAPHOSIDAE, 97
 Thesium, 125
thiota, Ceranthes, 33
 thorelli, Acanthodon, 68, 75
 Thorncroftia, 133
 Thorncroftii, Aloe, 122
 Ceropegia, 132
 Fagara, 128
 Plectranthus, 133
 Thunbergia, 133
 THYMELAEACEAE, 131
thyrsiflora, Sansevieria, 122
 thyrsoides, Senecio, 135
thysanarcha, Epiphraetis, 53
 TILIACEAE, 130
tincta, Opostega, 41
 Tinea, 44, 57
 TINEIDAE, 43, 57
 Tineola, 44
 Tirucalli, Euphorbia, 129
 Toddalia, 128
 tomentosa, Kalanchoe glandulosa, 126
tookai, Pelmatorycter, 63, 92
 TORTRICIDAE, 8
 Tortrix, 8
 Trachydora, 28
 Trachypogon, 121
 Tragia, 130
 transvaalense, Disperma, 133
 Jasminum, 132
 Trianthema, 25
 transvaalensis, Acanthodon, 111
 Bersama, 130
 Blepharis, 133
Bradypterus, 116
 Capparis, 126
 Crassula, 126
 Davalia parviflora, 132
 Diores, 106
 Euphorbia, 129
 Huernia, 132
 Lissochilus, 124
 Lotononis, 127
 Lotononis Gerrardi, 127
 Loranthus kraussianus, 124
 Numida papillosa, 2, 3
 Satyrium, 123
 Scabiosa, 134
 Schizochilus, 123
 triandra, Themedra, 121
 triangulifer, Diores, 106
 Trianthema, 125
 Tribulus, 128
 Tricalysia, 133
 trichadenia, Euphorbia, 129
 trichobasis, Bulbostylis, 122
 tricholaenoides, Digitaria, 121
 Trichomanes, 120
 Trichotaphe, 15, 23
 tricolor, Myotis, 112
 tridens, Corchorus, 130
 triflorum, Thesium, 125
 trigyna, Cotyledon, 126
 Trimeria, 131
 trinerve, Satyrium, 123
 trinervis, Trimeria, 131
 triphaca, Sterculia, 131
 Tripteris, 135
triumphalis, Idioglossa, 56
 Trochomeria, 134
 truncata, Euphorbia, 129
 Tryphostemma, 131
 tunbridgense, Hymenophyllum, 120
turgida, Trichotaphe, 24
 TURNERACEAE, 131
 Turraea, 128
 typhoideum, Pennisetum, 122
 typhurum, Panicum, 122
 typicum, Galeosoma coronatum, 82
 typicus, Galeosoma robertsi, 82
tyreuta, Sclerophricta, 46
 Tysoni, Brachycorythis, 123
 Habenaria, 123
 Habenaria dregeana, 123
 Neobolusia, 123
tysoni, Stasimopus, 63, 93, 95
 ugandensis, Warburgia, 60, 62
 ULMACEAE, 124
 UMBELLIFERAE, 132
umbraculata, Euxanthis, 8
 umbraculigerum, Helichrysum, 134
 umvotensis, Habenaria, 123
 undatum, Helichrysum, 134
 unguicornis, Blossia, 64, 65
unitum, Nephrodium, 120
 Polypodium, 120
 urens, Mucuna, 128
 urophyllus, Senecio, 135
 Ursinia, 135
 URTICACEAE, 124
 utile, Thesium, 125
 Vaillantii, Crassula, 126
 vandami, Galeosoma, 78 (Text-fig. 4c),
 80, 81; Pl. IV, fig. e
 Vangueria, 134
 variabilis, Arthrosolen, 131
 varius, Gladiolus, 123
vectoria, Anarsia, 21
 velutina, Crabbea, 133
 Odina, 130
 Venedium, 135
 VERBENACEAE, 133
 Verecunda, Aloe, 122
 Vernonia, 134
 versicolor, Sorghum, 121
 verticillata, Mollugo, 125
 verticilliflorum, Sorghum, 121
veterascens, Leuronoma, 16
vibrans, Gracilaria, 40

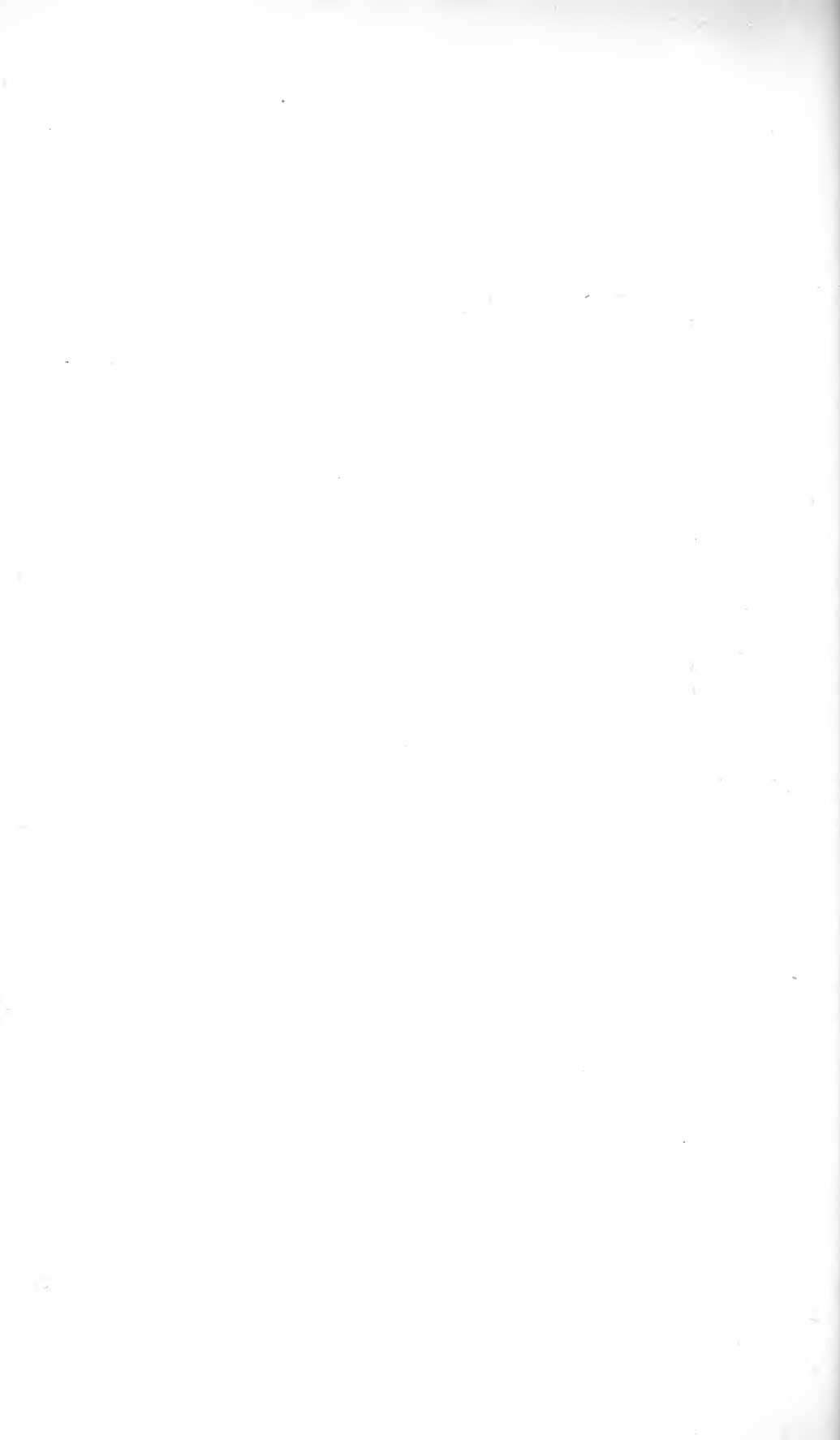
- victorini, *Cryptillas*, 116
victrix, Laspeyresia, 12
 villosa, *Grewia*, 130
 Pollinia, 121
 Rhus, 130
 villosum, *Schistostephium*, 135
 villosus, *Coccolus*, 126
 viminea, *Buchenroedera*, 128
 vimineus, *Senecio*, 135
violescens, Laspeyresia, 51
 virens, *Mollugo hirta*, 125
 virgata, *Cluytia*, 129
 viridifolia, *Gerbera*, 135
 viridis, *Pellaea*, 121
 viscosa, *Sphenandra*, 133
 viscosum, *Acrostichum*, 121
Viscum, 124
 VITACEAE, 130
Vitex, 133
 vittatus, *Diores*, 106
 vittipes, *Diores*, 106
Viverra, 112
 vorax, *Pterinochilus*, 102 ftn
 vulpecula, *Homostola*, 108

Wahlenbergia, 134
Wakefieldii, 124
Warburgia, 60, 131
Watkinsonii, *Eulophia*, 124
Welwitschii, *Monechma*, 133
Wickensii, *Aloe*, 122
 Cotyledon, 126
wilmsianum, *Satyrium*, 123
Wilmsii, *Acalypha*, 130
 Adenia, 131
 Alchemilla, 126

Wilmsii, *Argyrolobium*, 128
 Lasiosiphon, 128
 Lotononis, 127
 Melolobium, 127
 Psoralea, 128
wintoni, *Chrysochloris*, 113
Woodii, *Lotononis*, 127
Wormskioldia, 131

xanthochyta, Crobylophora, 41
xanthomilas, *Euplectes*, 117
Xanthoxylon, 128
Ximenia, 125
xylophracta, Cladophantis, 34
 XYLORYCTIDAE, 33, 54

Zantedeschia, 122
zebrina, *Homostola*, 90, 108
 Huernia, 132
 Spiroctenus, 90, 108
zelotypa, Proceleustis, 54
Zesticodes, 46
Zeyheri, *Pharnaceum*, 125
 Platanthera, 123
 Scolopia, 131
 Tribulus, 128
zeylanica, *Dicliptera*, 133
zeylanicum, *Heliotropium*, 132
 ZINGIBERACEAE, 123
 ZODARIIDAE, 63, 105
zonale, *Pelargonium*, 128
Zosterops, 2
zygodes, Tinea, 44
 ZYGOPHYLLACEAE, 128
zymotis, *Leuronoma*, 16





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ANNALS MEDEDELINGEN
OF THE VAN HET
TRANSVAAL MUSEUM.

VOL VI.

PART 1, *containing* :

Descriptions of a New Species and Genus of Flycatchers from East Africa, and two New Subspecies of Guinea Fowls from South Africa. By AUSTIN ROBERTS.

Descriptions of two New Species of a New Subgenus of Bats, and a New Species of Molerats. By AUSTIN ROBERTS.

Issued 28th June, 1917.



PRETORIA:
BUCKLEY & VAN DUYN, PRINTERS.
1917

ANNALS

MEDEDELINGEN

OF THE

VAN HET

Transvaal Museum.

VOL. 6.

PART 1.

DESCRIPTIONS OF A NEW SPECIES AND GENUS OF FLYCATCHERS
FROM EAST AFRICA AND TWO NEW SUBSPECIES OF
GUINEA FOWLS FROM SOUTH AFRICA.

By AUSTIN ROBERTS.

While on active service in German East Africa, I was fortunate in procuring, together with a few other birds, a single specimen of a flycatcher which proves to represent an undescribed species and genus, which I propose to name:

CHLOROPETELLA gen. nov. +

Diagnosis: Apparently most closely allied to *Chloropeta*, but differing therefrom in its much smaller size, the bill narrower and more de-curved apically, the greater number of rictal bristles and in habits and habitat. The rictal bristles are comparatively longer and nasal bristles are conspicuous all along the base of the forehead, where they are almost absent and certainly fewer in number in *Chloropeta*. The tail is rounded, consists of ten feathers, and is about equal to the wing in length. The wing formula is: 1st primary about 55% of the length of the second; 2nd rather shorter than the eighth; 3rd and 6th about equal; 4th and 5th about equal and longest.

CHLOROPETELLA SUAHELICA spec. nov. +

Description: upper parts in general olive yellow, rather darker sub-terminally on the tail, and the external margins and base of the tail rather clearer yellow; primaries and secondaries brown, the first and second primaries uniform, the third narrowly and the remainder broadly

margined with olive yellow for the basal two-thirds. Entire under parts of the body, the throat and the chin "primuline yellow" (Ridgway), sides of the face rather more olive, and the under wing coverts rather paler, yellow; under surface of the wings brown, with broad whitish inner margins; under surface of tail feathers olive yellow, the inner margins and tips of the outer ones clearer yellow. "Iris brown; bill light brown above, pale horn brown below; legs light brown, feet rather paler." Length of wing 47 mm., tail 47, tarsus 15, culmen 11, breadth of bill at the base 6.

The type, which is in the Transvaal Museum collection, is a female taken on 27th January, 1917, at Myiai, an outpost situated forty miles south-west of Dar-es-Salaam on the Maneromango road and about twelve miles from that village.

Habits: It was the habits and habitat of this bird which first led me to think that it might prove to be a novelty, and after several attempts to secure a specimen it was only on the day of my departure that I succeeded. On the first occasion on which I observed these birds, three were sitting affectionately side by side on a twig not six feet above my head in a pathway through the bush; they remained there for some time while I noted how different they appeared to be from any bird which I had previously met with or read about; upon my disturbing them to obtain another view, they hopped about amongst the branches a little farther away, but regarded me more with curiosity than fear. They appeared to be rather uncommon, as I saw them again only upon about five or six occasions and then only when I had no means of securing a specimen, except on the last, when I brought down one with a catapult and fine shot. They were noted to be lively little birds, always found in small parties of three or four, usually sitting very quietly until disturbed, whereupon they would flit about, uttering a sharp twittering note which might almost be described as a song; at other times, when in search of insects, they were remarkably quick in fitting up and down and about amongst the branches of the trees in the tangled scrub. But for their brown eyes and active manner when in movement, they might be mistaken for a species of *Zosterops*.

Chloropeta natalensis, the genotype and only species of the genus with which I have compared this new bird, has quite different habits. Very little has been recorded of it, and I have myself only seen it on a few rare occasions, some ten years ago, in Natal. It frequents the coarse herbage found along the streams and valleys below and on the sides of mountains, and has the habits of a warbler rather than of a flycatcher; I have never seen more than one bird at a time, and it always proved to be very shy and upon being alarmed immediately took refuge in the tangled vegetation. The northern subspecies of *Chloropeta natalensis* do not differ appreciably in size or habits from the typical subspecies.

NUMIDA PAPILLOSA DAMARENSIS subsp. nov.

Differs from the typical *Numida papillosa* Rehw. in having the horn very narrow from the base to the tip, resembling a bent finger in shape. All figures of *N. papillosa* show that the typical form has the horn broad at the base and narrowing upwards, whereas in the present new subspecies the horn is practically the same thickness for the whole length. *N. papillosa transvaalensis* Neum. (Orn. Monatsb. 1899, p. 26) differs in having the papillae less developed than in the typical subspecies, and the horn much curved backwards.

N. coronata is a subspecies of *mitrata* and there is no evidence that *mitrata* and *papillosa* are subspecifically connected, even though *transvaalensis* has the papillae less developed than in the more western birds. The following measurements will best illustrate the difference in the size of the casque of all these forms, the three from Windhuck, S. W. African Protectorate, representing the type series of *N. p. damarensis* :—

Species.	Locality.	Wing.	Culmen	Casque.		
				Breadth at base.	Breadth midway.	Length from ant. base.
<i>N. mitrata coronata</i> ,	Fish River	295	26	30	22	49
" "	" Barberton	274	25	29	18	50
" "	<i>mitrata</i> , Boror	268	26	25	—	30
" "	<i>papillosa transvaalensis</i> , Pretoria	280	25	30	19	50
" "	" Rustenburg... ..	280	22.5	29	18.5	50
" "	" Rustenburg... ..	280	23	29	18	53
" "	<i>damarensis</i> , Windhuck	280	22	16	11.5	38
" "	" "	... 285	24	17	10	37
" "	" "	... 293	24	15	9	37

3

GUTTERA EDOUARDI SYMONSI subsp. nov.

Differs from the typical *G. edouardi* (Hartl.) from the coast of Natal in having only the faintest traces of chestnut coloration in the feathers of the lower neck, back, scapulars, chest and flanks and the white spots more distinctly blue, the whole general effect produced by these differences being very marked. *G. lividicollis* Ghigi (Mem. Acc. Sc. Instit., Bologna, vi, pl. ii, 1905) does not appear to differ from the typical *G. edouardi* in the feather coloration, but has been founded upon the coloration of the skin of the neck. No notes were made upon the colour of the soft parts of this new subspecies at the time of their capture, and I am therefore unable for the present to detail them; but Mr. R. E. Symons, who was kind enough to send a series of five specimens to the Transvaal Museum, but is away from home at the time of writing, has promised to remedy the omission when next he is able to secure specimens; the lack of these particulars does not, however, affect the status of the new subspecies. The specimens examined are two pairs of adults and an immature male, the last still retaining black and buffish down on the back of the head and short black feathers, some tipped with dirty white, on the throat; the crest is also not fully developed. Essentially the immature specimen does not differ from the adults—but traces of bars instead of spots of bluish white are to be seen in the outer wing-coverts, abdominal region and flanks, and particularly on the tail feathers. The type series (of which T.M. No. 11585 is the type) was taken at Karkloof (3,500ft.), Natal, by Mr. R. E. Symons, after whom I have pleasure in naming the subspecies.

Dimensions: Adults, length of wing from tip of primaries 260-275 mm; tail 140-160; metatarsus 80; culmen 22-25. Immature, wing 250, tail 130, metatarsus 72, culmen 22.

DESCRIPTIONS OF TWO NEW SPECIES OF A NEW SUBGENUS OF BATS AND A NEW SPECIES OF MOLERATS.

By AUSTIN ROBERTS.

PLATYMOPS PETROPHILUS spec. nov.

This bat has a superficial resemblance to *Nyctinomus aegyptiacus* (S. African specimens), but upon close examination is found to differ in having the ears more widely separated at the inner base; the antitragus represented by a mere thickening of the lobe; the horny points on the upper part of the ear commencing near the rim of the ear and not far down as in *aegyptiacus*; the thumb very thick; the first and fifth toes also very thick—equal to double that of either of the other three—and thickly covered above and on the outer surface with fine white bristly hairs, but with hardly any of the very long bristles found in *aegyptiacus*; the ears are haired as in *aegyptiacus*, but the area around the fibulae is more sparsely covered with white hairs. The ears arise about 4mm. apart to a height of a little more than 1 mm. and the upper margin thence for about 13 mm. is practically horizontal, thence curving downwards a little way, increasing the breadth of the ear to 15 mm., then downwards and very slightly inwards for about 9.5 mm. to a point whence an increasing tendency inwards for 4 mm. carries the lower margin in an almost straight line to the outer base; the antitragus is represented by a broadening and thickening of the lobe, flattened or slightly folded on the upper surface, with only a slight emargination beyond its outer edge; the tragus is like that of *aegyptiacus*, quadrate, rather narrower at the base than the tip, with a slight notch in the outer edge. The horny points on the upper margin of the ear are five in number just below the horizon, the rest on the edge of the ear, producing a saw-like horizon. The lips are wrinkled, the nostrils sub-lateral and no glands appear to be present. The wings arise on the tibia at about one-third of the length of the tibia from the feet.

The skull of the type is, unfortunately, fragmentary, having been crushed when the rock was overturned under which it had taken up its abode. Nevertheless, from what there is of it, the dentition is clearly seen to be numerically identical with that of *N. aegyptiacus*, but the skull is flattened as in *Platymops* Thos. (Ann. & Mag. N.H., ser. 7, vol. 17, p. 499, 1906); the premaxillae do not meet anteriorly, and the incisors are large and convergent; the foremost premolar (P²) is small, but easily seen without the aid of a lens, and is situated between the C and P₄, well within the tooth row; the lower anterior premolar is slightly smaller than the posterior premolar.

Dimensions (taken from a spirit specimen): Length of the head and body 53 mm., of the tail 38, of the free portion of the tail 15; diameter of the ear, vertically 14, horizontally 15; height of tragus 2.5; length of snout to the inner base of the ear 7; forearm 42; thumb 7; third digit, metacarpal 42, 1st phalanx 16, 2nd without the cartilage 15, with the

cartilage 22; fourth digit, metacarpal 41, 1st phalanx 15, 2nd phalanx without cartilage 8.5, with cartilage 11.5; fifth digit, metacarpal 27, 1st phalanx 11, 2nd with the cartilage 7.5; tibia 9; hind foot length (c.u.) 8, breadth 4; breadth of ankle pad 2. Skull: Length of dental series, from front of C to back of M3, 7.4; greatest length of mandible 13.5.

Type: Adult male, in spirits, taken by G. van Dam at Bleskop, near Rustenburg, 2nd February, 1917.

PLATYMOPS HAAGNERI spec. nov.

A small species having an affinity to *P. petrophilus* in the dental formula, flattened skull, absence of a definite antitragus, shortness and number of the bristles on the toes, and in the horny points on the upper part of the ears being situated near the horizon of the ear; but differing therefrom in its smaller size, the horny points on the ears only two in number; the lower P2 much smaller than the P4, which is higher, the tips of M₁, P₄ and C forming an almost straight line at a slight angle rising forward; the upper incisors are also comparatively shorter than in *petrophilus*, and a cingulum can be seen in P2 with the aid of a lens. The lower incisors are bifid. The bony palate extends well behind the molars.

Dimensions of the type in spirits: Length of the head and body 50 mm.; of the tail 32, of the free portion of the tail 13.5; ear, height 10, breadth 13.5; height of the tragus 2.3; length of forearm 37; pollex (c.u.) 5; third digit, metacarpal 37, 1st phalanx 14, 2nd without cartilage 12; fourth digit, metacarpal 36, 1st phalanx 12.5, 2nd phalanx without cartilage 6; fifth digit, metacarpal 25, 1st phalanx 10, 2nd 4.7; tibia 10; hind foot, length (c.u.) 6.5 Skull: Greatest basal length 16.2; zygomatic width 10; width at mastoid 9.8; width of brain case 9; interorbital constriction 3.7; basilar length 13.1; palate length 5.5; length of dental series, from front of C to back of M3, 6; width of palate taken outside the molars 7; greatest length of mandible 12.

Type: Adult male from Keetmanshoop, Damaraland, presented to the Museum by Mr. Sigmund Haagner.

These two species apparently belong to the genus *Platymops* Thos., but differing as they do in the dental formula, the P2 being present, I propose to place them in a new subgenus bearing the name of SAUROMYS, of which *P. haagneri* maybe taken as the genotype. The following figures will indicate the difference in the height of the skull of *N. aegyptiacus* and the present new species, the measurements having been taken from the tips of the P⁴ vertically parallel to the top of the premaxilla:

N. aegyptiacus 6.5 mm., *P. petrophilus* 4.2, *P. haagneri* 4.

GEORYCHUS PALKI spec. nov.

Most closely allied to *G. anomalus* mihi in having the nasals long and narrow and the same buffish grey coloration; but differing from this and all other members of this group in having a very distinct semi-circular notch in the upper anterior angle of the ocular area of the skull, this notch effecting a thinning of the arch of the maxilla above the antorbital foramen and opposite the antorbital process. In two adult specimens the hindmost molar is very large, equal in diameter to the foremost tooth.

Dimensions: Length of the head and body 150 mm.; tail 22; hind

,foot (s.u.) 29. Skull: Extreme length from the tips of the incisors 42.4; length from the apex of the premaxilla 38.7, from the tips of the nasals 37; basilar length 32.5; greatest zygomatic width 29.2; width of brain case 16.8; mastoid width 20; inter-orbital constriction 8.4; width of premaxilla 8.7; width of incisors at the exposed base 6.4; length of molar series 7.5; diastema 12.8; length of bony palate 24.2; greatest diametre of bullae, including the internal projection, 10.3; nasals 15.6 x 4.1.

Type: Old male, No. T.M. m 2085, taken at Venterskroon, on the banks of the Vaal River, Potchefstroom District, 24th March, 1917. Also a series of five younger specimens from the same colony, showing the same characters; but unfortunately the only female captured is not mature and the number of mammae is not known.

I have named this animal after Mr. Robert Palk, who materially assisted me in effecting their capture.

Besides these specimens, two others were captured in another colony, an adult female and a young adult male, which have all the characters, including the number of mammae, of *G. natalensis* mihi, though they are somewhat paler on the muzzle. This again illustrates the necessity for carefully noting which colonies specimens were captured in, each species apparently living upon a particular vegetable food.



ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VI

PART 2 *containing*

Descriptions of South African Micro-Lepidoptera

By E. MEYRICK, B.A., F.R.S.

A New Species of Warburgia from the Transvaal

By Mrs R. POTT

Issued 31st August, 1918



PRINTED AT THE UNIVERSITY PRESS

CAMBRIDGE, ENGLAND

1918



ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOL. 6

PART 2

DESCRIPTIONS OF SOUTH AFRICAN
MICRO-LEPIDOPTERA

By E. MEYRICK, B.A., F.R.S.

PTEROPHORIDAE

Platyptilia bullifera n.sp.

♀ 20 mm. Head pale brownish, face and sides of crown whitish. Palpi $2\frac{1}{4}$, brownish mixed with dark fuscous, base and apex white. Thorax pale brownish, posteriorly whitish. Abdomen whitish, on sides and posteriorly mixed with fuscous. Forewings cleft to beyond $\frac{3}{4}$, second segment narrow at base and posteriorly dilated, apex pointed, termen of first segment concave, oblique, of second concave, little oblique; pale brownish suffusedly irrorated with white except towards anterior half of costa, towards costa suffused with reddish-fuscous, costal edge suffused with dark fuscous towards middle; a trapezoidal dark reddish-fuscous spot crossing middle of first segment, narrowed downwards, edged anteriorly with white suffusion broader towards costa, and posteriorly by a white line; a trapezoidal dark reddish-fuscous spot occupying basal half of second segment; both segments beyond these markings light red-brownish sprinkled with white: cilia whitish, on costal spot dark fuscous, on termen with basal third brown edged by a dark fuscous line, twice interrupted with white on first segment, within cleft grey mixed with whitish on lower margin of first segment, on dorsum with three dark grey patches tipped with black, viz. one moderate at $\frac{3}{5}$ of wing, one narrow beneath cleft, and one broad from near this to tornus. Hindwings dark grey, third segment $\frac{3}{5}$ of first; cilia grey, tinged with whitish on lower angle of second segment, on dorsum with an inconspicuous tooth of three or four blackish-tipped scales at $\frac{3}{5}$ of third segment, and three or four scattered similar scales near before this.

ZULULAND, Eshowe, in January (Janse); one specimen. A very distinct species, of early type.

CARPOSINIDAE

Carposina exsanguis n.sp.

♀ 15 mm. Head and thorax white, patagia faintly tinged with ochreous. Palpi ochreous-whitish finely sprinkled with dark fuscous. Forewings elongate, rather narrow, posteriorly slightly dilated, costa gently arched, apex pointed, termen nearly straight, oblique; ochreous-whitish, faintly clouded with very pale greyish-ochreous; an indistinct mark of fuscous suffusion along basal sixth of costa, and five very small faint fuscous or greyish-ochreous costal spots between this and apex: cilia ochreous-whitish faintly speckled with light grey. Hindwings and cilia whitish.

TRANSVAAL, Barberton, in December (Janse); one specimen.

PHALONIADAE

Euxanthia umbraculata n.sp.

♀ 16-19 mm. Head ochreous-whitish. Palpi 3, whitish-ochreous. Thorax whitish, partially suffused with pale ferruginous. Abdomen dark grey, apex ochreous-whitish. Forewings elongate, rather narrow, somewhat dilated posteriorly, costa hardly arched, faintly sinuate in middle, apex obtuse, termen straight, oblique; light ferruginous-ochreous, more or less mixed with whitish; some ferruginous-brown marking on basal area, and anterior half of costa suffused with ferruginous-brown; a rather narrow ferruginous-brown median fascia, mixed with dark fuscous on dorsal half, obtusely angulated or tending to be interrupted above middle; a small dark fuscous discal dot beyond this; three small brown spots on costa between this and terminal fascia; a suffused ferruginous-brown terminal fascia, tending to be produced anteriorly in suffused streaks along veins towards cell: cilia whitish-ferruginous, barred or sometimes generally suffused with rather dark grey, with dark grey subbasal line. Hindwings dark grey; cilia whitish, with grey subbasal line.

TRANSVAAL, v.d. Merwe and Middelburg, in October and December (Janse); two specimens.

TORTRICIDAE

Tortrix corroborata n.sp.

♂ 15 mm. Head and thorax pale brownish-ochreous. Palpi $3\frac{1}{2}$, brownish-ochreous. Antennal ciliations 1. Abdomen dark grey, anal tuft ochreous-whitish. Forewings suboblong, moderate, costa anteriorly strongly, posteriorly hardly arched, without fold, apex obtuse, termen faintly sinuate, hardly oblique; pale brownish-ochreous, tinged with silvery-grey on dorsal half; basal patch little marked, partially suffused with light ferruginous-brown except towards costa, edge irregularly curved; central fascia moderate, oblique, ferruginous-brown, on dorsal half dilated and suffused with grey posteriorly except on edge, costal edge dark fuscous; costal patch semioval, ferruginous-brown, suffused with blackish on costal edge, connected by an irregular stria with termen above tornus: cilia pale ochreous, basally somewhat dotted or barred with blackish, more strongly above apex and beneath tornus. Hindwings dark grey; cilia pale greyish, with dark grey subbasal shade.

ZULULAND, Nkandhla Forest, in January (Janse); one specimen.

Tortrix metapyrrha n.sp.

♀ 18 mm. Head and thorax whitish-yellow. Palpi $2\frac{1}{2}$, pale yellowish. Abdomen pale whitish-ochreous. Forewings elongate, rather narrow, costa

slightly arched, apex obtuse-pointed, termen almost straight, rather oblique; pale yellowish; a faint greyish dot on lower angle of cell: cilia light ochreous-fulvous, towards tornus yellow-whitish. Hindwings and cilia ochreous-whitish.

TRANSVAAL, Pretoria, in September (Janse); one specimen.

Cnephasia pachydesma n.sp.

♀ 10 mm. Head whitish-ochreous, centrally tinged with grey. Palpi $1\frac{1}{2}$, whitish-ochreous. Thorax whitish-ochreous-grey. Abdomen grey. Forewings elongate, moderate, posteriorly somewhat dilated, costa gently arched, apex obtuse, termen slightly rounded, oblique; pale ochreous; markings dark grey mixed with blackish; basal patch occupying $\frac{1}{4}$ of wing, edge irregular, angulated below middle; central fascia moderately broad, straight, oblique; an almost terminal fascia, broad on costa, narrowed downwards to tornus; discal area between these markings broadly suffused with grey sprinkled with blackish: cilia pale ochreous, beneath tornus dark grey. Hindwings dark grey; cilia grey, with dark grey subbasal shade.

ZULULAND, Nkandhla Forest, in January (Janse); one specimen.

Cnephasia flavisecta n.sp.

♂ 10 mm. Head ochreous-yellow, centrally yellow-whitish. Palpi 2, ochreous-yellowish. Thorax ochreous-yellowish, patagia grey except shoulder. Abdomen grey. Forewings elongate, posteriorly somewhat dilated, costa moderately arched, apex obtuse, termen nearly straight, oblique; golden-yellowish; markings slaty-grey, irregularly sprinkled with black, and partially mixed with whitish; a moderate basal patch, outer edge hardly curved, vertical, including an elongate blotch of ground-colour from base of costa and a small spot below fold; a moderate direct median fascia, somewhat expanded towards dorsum, its posterior edge suffused with black on upper half; a narrow fascia from $\frac{2}{3}$ of costa to tornus, and one just before apex marked with black on edges, these connected by a slender bar in disc: cilia whitish-yellowish. Hindwings pale grey; cilia grey-whitish.

ZULULAND, Eshove, in January (Janse); one specimen.

EUCOSMIDAE

Eucosma incita Meyr.

♀ 11-12 mm. Head and thorax grey, thorax sometimes with blackish median transverse bar. Palpi fuscous irrorated with whitish. Abdomen rather dark fuscous. Forewings elongate, posteriorly slightly dilated, costa gently arched, apex obtuse, termen faintly sinuate, somewhat oblique; brownish-grey; costa marked with alternate groups of very fine whitish and blackish strigulae; an angulated median transverse fascia composed of several confluent leaden striae; short leaden marks rising from costal groups of whitish strigulae beyond this; ocellus reaching $\frac{2}{3}$ across wing, laterally margined with leaden-metallic streaks of which posterior is cut in middle by a very fine black dash from its interior, three fine black linear marks within ocellus above this, and some irregular short confused black dashes above and before its upper part; apex dark fuscous: cilia grey sprinkled with white. Hindwings with 3 and 4 connate; dark grey, lighter anteriorly; cilia light grey, with darker subbasal shade.

NATAL, Umkomaas, in January (Janse); four specimens. I have redescribed this obscure species from this improved material, as its distinguishing features were not previously adequately expressed.

Eucosma bisecta n.sp.

♂ 11 mm. Head and palpi dark slaty-grey, face blackish. Thorax dark fuscous, posterior half suffusedly mixed with ochreous. Abdomen dark grey. Posterior tibiae tufted with rough projecting scales beneath. Forewings elongate, posteriorly rather dilated, costa gently arched, apex rounded, termen somewhat rounded, oblique, sinuate-indentured above middle; blackish-fuscous; dorsal half from base to beyond middle marked with irregular transverse blue-leaden strigae partially irrorated with whitish-ochreous; basal area suffused with greyish-violet above this; two greyish-violet streaks from about $\frac{2}{5}$ of costa to beyond middle of disc, thence acutely angulated to near dorsum, touched with white on costa; a similar oblique streak from $\frac{3}{5}$ of costa, angulated in middle to tornus, followed on upper half by a fine line of pale ochreous-yellowish irroration, its lower portion edged anteriorly with pale ochreous-yellowish and followed by an irregular pale ochreous-yellowish patch representing ocellus and including two or three blackish dots; two conspicuous white direct strigulae on costa at $\frac{4}{5}$, terminated beneath by short oblique ochreous-yellowish marks, beyond which is a greyish-violet dot: cilia grey, round apex with blackish basal and shorter apical lines, whitish-suffused at both extremities of apical line, lower forming a whitish spot extending to basal line, beneath this with a spot of dark fuscous suffusion. Hindwings with 3 and 4 stalked, 6 and 7 stalked; dark grey, towards base with a hyaline space beneath cell; cilia light grey, with dark grey subbasal shade.

ZULULAND, Eshowe, in January (Janse); one specimen.

Eucosma desipiens n.sp.

♂ 11 mm. Head, thorax, and abdomen grey-whitish. Palpi densely rough-scaled, white, with oblique light grey median band. Forewings elongate, rather narrow, costa gently arched, with moderate fold from base to $\frac{2}{5}$, apex obtuse-pointed, termen faintly sinuate, oblique; light grey with tips of scales white; costa from beyond fold marked with dark fuscous strigulae, and three small dark fuscous spots; small scattered undefined spots of fuscous suffusion towards dorsum and in disc posteriorly, and an indistinct streak of fuscous suffusion from beyond middle of costa to tornus, angularly projecting in middle, with a line of blackish scales in disc running into angle; apical area of wing dark grey; ocellus margined laterally with thick silvery-whitish streaks, and containing three short black linear marks: cilia whitish-grey sprinkled with white and fuscous, at apex with a fuscous bar. Hindwings with 3 and 4 stalked; pale grey; cilia grey-whitish.

TRANSVAAL, Alberts-mine, in January (Janse); one specimen.

Eucosma glyphicodes n.sp.

♀ 20 mm. Head light brownish, face suffused with dark fuscous. Palpi dark fuscous, towards base white. Thorax blackish, patagia mixed with ochreous-brown and whitish. Abdomen fuscous. Forewings elongate, costa anteriorly gently arched, posteriorly nearly straight, apex obtuse, termen nearly straight, somewhat oblique; white, partially suffused with whitish-ochreous; basal portion mixed with pale leaden-grey and irregularly marked with black, its margin irregularly black, rather oblique, enclosing a clear white spot on dorsum; between this and central fascia are two or three interrupted irregular transverse pale leaden-grey streaks, and two black dots on costa; central fascia little oblique, formed of irregular pale leaden-grey and black markings somewhat mixed with light reddish-ochreous, especially a black spot on middle of costa and an irregular longitudinal black mark projecting pos-

teriorly in disc; two small black spots on costa beyond this; a leaden-grey patch resting on upper half of termen, including an irregular black spot, apex and upper half of termen marked with small black spots; ocellus limited anteriorly by a leaden-grey streak confluent with this: cilia grey, basal half barred with light greyish-ochreous, at tornus with an ochreous-whitish patch, at apex blackish-grey. Hindwings with 3 and 4 stalked; grey; cilia grey.

NATAL, Sarnia, in November (Mrs Curry); one specimen.

Eucosma melanaula Meyr.

ZULULAND, Eshowe, in January (Janse); an Indian species, not previously recorded from South Africa; the larva feeds on cultivated *Leguminosae* (*Cajanus*, *Phaseolus*), and therefore doubtless the species has been artificially introduced.

Polychrosis ephippias Meyr.

NATAL, Umkomaas, in January (Janse); another common Indian species, not previously noticed from South Africa; the larval habits are unknown.

Argyroploce caryocoma n.sp.

♂ 13 mm. Head and palpi dark ferruginous-brown. Thorax white, dorsally and on shoulders mixed with dark fuscous, at apex of patagia with deep ferruginous, dorsal crest double, deep ferruginous. Abdomen grey-whitish, segmental margins grey. Forewings elongate, moderate, posteriorly rather dilated, costa gently arched, apex obtuse, termen somewhat rounded, hardly oblique; 7 and 8 very shortly stalked; whitish; costa marked with fine oblique blackish strigulae suffused with brown; some grey suffusion at base and along dorsum to near middle; raised black dots beneath fold near base and before middle; an ill-defined grey transverse blotch from $\frac{1}{3}$ of costa to fold, some pale leaden-grey marbling in disc beyond this; central fascia beyond middle, little oblique, narrow, very irregular, more or less interrupted in middle and towards dorsum, grey sprinkled with black and marked with black on posterior margin near costa, preceded on lower half by a pale leaden-grey striga; a pale brownish streak beneath costa posteriorly, crossed by some oblique blue-lead marking, beneath this two blackish dots; ocellus edged anteriorly by a long pale bluish-lead striga and posteriorly by a shorter silvery-whitish striga, brown mixed with black and white hairscales, closed above by a brown spot, terminal area beyond this brown with a white striga: cilia grey-whitish with two or three dark fuscous scales, towards tornus white. Hindwings with 3 and 4 short-stalked; grey; cilia grey-whitish, with grey subbasal shade.

NATAL, Umkomaas, in January (Janse); one specimen.

Argyroploce erythrope n.sp.

♂ 15 mm. Head reddish-fuscous. Palpi curved, ascending, dark reddish-fuscous, terminal joint very short, pale. Thorax fuscous. Abdomen grey. Forewings elongate, moderate, posteriorly rather dilated, costa slightly arched, apex rounded-obtuse, termen rounded, somewhat oblique; fuscous mixed with dark fuscous; costa minutely strigulated with pale irroration; two confluent dull red dots transversely placed on end of cell; a light brownish marginal streak round apex and upper part of termen, attenuated downwards to a point: cilia fuscous, finely whitish-sprinkled, with a dark fuscous subbasal line. Hindwings rather dark grey; cilia grey, becoming whitish towards tips, dorsal margin with an erect fringe of expanded whitish hairs. Hindwings beneath with veins 2-4 clothed with a patch of rough grey hairscales except towards termen.

NATAL, Umkomaas, in January (Janse); one specimen.

Argyroploce asterota n.sp.

♀ 16 mm. Head grey-whitish, forehead tinged with yellowish. Palpi light greyish sprinkled with white, second joint with two spots of dark fuscous irroration. Thorax grey-whitish, anteriorly suffused with darker grey, shoulders and crest tinged with yellowish. Abdomen dark grey. Forewings elongate-triangular, costa gently arched, apex obtuse, termen straight, somewhat oblique; dark grey, mixed here and there with olive-greenish and strewn with irregular silvery-leadens spots; costa suffusedly mixed with blackish, with pairs of direct indistinct whitish strigulae; an interrupted slender black longitudinal streak in disc from $\frac{2}{3}$ to near termen; a suffused white fascia from $\frac{3}{4}$ of costa to dorsum before tornus, interrupted by grey suffusion round this streak; apical area greenish-fulvous spotted with silvery-leadens: cilia grey sprinkled with white and dark fuscous. Hindwings rather dark grey; cilia whitish-grey, with dark grey subbasal shade.

ZULULAND, Eshowe, in January (Janse); one specimen.

Argyroploce propitia n.sp.

♂ 11 mm. Head grey-whitish. Palpi whitish partially mixed with grey, second joint with long hairs beneath. Thorax whitish, anteriorly and posteriorly mixed with ochreous, shoulders with dark grey spots. Abdomen dark grey, anal tuft whitish towards tips. Forewings elongate, posteriorly dilated, costa gently arched, apex obtuse, termen nearly straight, somewhat oblique; whitish, somewhat sprinkled with grey, anterior half of costa marked with dark grey strigulae, posterior half dark fuscous with five pairs of white strigulae; basal patch somewhat strigulated with dark red-brown on dorsal half, its outer edge marked by a blackish stria interrupted beneath costa and slightly bent in middle; central fascia somewhat oblique, on upper half narrow, blackish-grey, on lower moderately broad, grey suffused with pale ochreous, posterior edge angulated in middle; beyond this a rather narrow irregular fascia of leaden-grey suffusion; anterior edge of ocellus formed by a thick pale leaden-grey streak; a roundish greyish-ochreous patch towards apex, extending indistinctly downwards into ocellus, in which is a short blackish mark, and connected with middle of termen by a short oblique suffused dark grey streak; a small dark red-brown apical spot: cilia dark slaty-fuscous, with dark red-brown basal line, and red-brown tornal patch. Hindwings with 3 and 4 short-stalked; blackish-grey, with a subdorsal fold white-scaled internally and containing a pencil of long grey hairs; cilia grey, with dark grey basal line.

ZULULAND, Eshowe, in January (Janse); one specimen.

Laspeyresia victrix n.sp.

♂ 10 mm. Head and thorax dark fuscous, irrorated with whitish. Palpi white somewhat sprinkled with dark fuscous. Abdomen dark grey. Forewings elongate-triangular, costa hardly arched, apex obtuse, termen bowed, somewhat oblique; blackish, with tips of scales white, forming a fine nearly regular transverse striation; a rosy-leadens-metallic transverse streak at $\frac{1}{3}$, hardly reaching costa or dorsum; a thicker rosy-leadens-metallic streak from middle of costa to beyond middle of dorsum, thinner and tinged with pale blue towards costa; space between this and next markings wholly blackish except on a patch below middle; three short bluish-leadens strigae from costa posteriorly; ocellus margined anteriorly by a thick rosy-leadens-metallic streak reaching more than half across wing, posteriorly by a short and slender bluish-

leaden-metallic streak, and crossed by four black lines; a terminal streak of whitish irroration: cilia light grey, with black basal line, iridescent on outer half, irrorated with black towards tips round apex. Hindwings with 3 and 4 connate; fuscous, paler and thinly scaled towards base, suffused with dark fuscous posteriorly; cilia light grey, with dark fuscous subbasal shade.

NATAL, Umkomaas, in January (Janse); one specimen.

Laspeyresia areata n.sp.

♂ 13 mm. Head dark fuscous irrorated with white. Palpi white, irregularly sprinkled with dark fuscous. Thorax dark fuscous, partially sprinkled with white, patagia with white apical patch. Abdomen grey. Forewings elongate-triangular, costa anteriorly straight, posteriorly gently arched, apex obtuse, termen bowed, somewhat oblique; blackish; basal fourth strewn with suffused white strigulae; costa beyond this with about eight pairs of white strigulae whence rise indistinct short fine blue-leaden strigae; a large white rather oblique transverse blotch resting on dorsum beyond middle and reaching more than half across wing, anterior edge convex, posterior confluent in disc with a broad patch of ochreous-white suffusion extending across wing from five posterior pairs of strigulae to tornus, including a silvery-metallic dorsal streak representing anterior margin of ocellus and a small mark on its posterior margin; the narrow terminal streak beyond this is finely speckled with whitish: cilia grey. Hindwings with 3 and 4 connate; fuscous, lighter towards base, suffused with dark fuscous posteriorly; cilia ochreous-white, with dark grey basal shade.

TRANSVAAL, Pretoria, in November (Janse); one specimen.

Laspeyresia excoriata n.sp.

♂ 10 mm. Head and palpi whitish-grey-ochreous, crown spotted with light grey. Thorax whitish-grey-ochreous, spotted and anteriorly suffused with dark fuscous. Abdomen grey. Forewings elongate, posteriorly dilated, costa slightly arched, apex obtuse, termen faintly sinuate, somewhat oblique; dark fuscous, from base to beyond middle irregularly and coarsely mottled with whitish-ochreous, beyond this with extreme tips of scales whitish-ochreous; costa from near base to beyond middle with pairs of very fine whitish strigulae and beyond this with four single stronger white strigulae; a curved violet-leaden line running from last pair (beyond middle of costa) to anterior margin of ocellus, and an oblique line from second single strigula to a white mark on termen beneath apex; subcostal space between and beyond these yellow-ochreous, connected beneath with a yellow-ochreous patch representing ocellus and containing five longitudinal blackish marks, anterior limiting line broken and margined with ochreous-whitish towards lower extremity; a terminal streak of black and whitish speckling: cilia grey, towards tornus tinged with whitish. Hindwings with 3 and 4 stalked; grey, rather thinly scaled, veins darker; cilia whitish-grey, with dark grey basal line.

ZULULAND, Nkwaleni, in January (Janse); one specimen.

GELECHIADAE

Pynocstola Meyr.

All the South African species hitherto referred by me to *Paltodora* belong to this genus, which I have characterised as distinguished from *Paltodora* by the scaling of the palpi (*Ent. Mo. Mag.* 1917, 113).

Pycnostola crateraula n.sp.

♂ 27 mm. Head whitish mixed with grey. Palpi whitish, second joint irrorated with dark grey except apical edge, terminal joint anteriorly irrorated with dark grey. Thorax whitish, with a dorsal stripe of greyish suffusion, a fuscous line on each side of back, and a blackish blotch on shoulder. Abdomen fuscous, apex whitish. Forewings elongate, very narrow, costa faintly sinuate, posteriorly slightly arched, apex pointed, termen sinuate, very oblique; whitish; costa and veins suffused with blackish except on dorsal area beneath fold; some brown suffusion towards base of costa, above end of cell, and on a subterminal streak; large blackish dots suffused with brown beneath costa at $\frac{1}{8}$ and $\frac{3}{8}$; a short very fine black line along fold towards base; a blackish dot beneath fold at $\frac{1}{4}$ of wing; stigmata blackish, discal approximated, plical very obliquely before first discal; a slender blackish streak along termen: cilia on costa white with three blackish bars, tips grey, on termen whitish with two blackish-grey shades, on tornus ochreous-grey-whitish. Hindwings grey; cilia light greyish-ochreous, tips whitish.

NATAL, Standerton, in February (Janse); one specimen.

Pycnostola merista n.sp.

♀ 17 mm. Head white, centre of crown sometimes faintly fuscous-tinged. Palpi white, second joint irrorated with rather dark fuscous except apex, tuft short, terminal joint with median band of dark fuscous irroration. Thorax white irregularly mixed with rather dark fuscous. Abdomen whitish. Forewings elongate, narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; white, with scattered dark fuscous scales; markings formed by dark fuscous irroration; a short mark from costa near base, and a spot on base of dorsum; narrow irregular oblique fasciae at $\frac{1}{8}$ and $\frac{3}{8}$, plical stigma visible as a darker mark on second; discal stigmata represented by round spots at middle and $\frac{2}{3}$, first confluent with larger spots beyond it on costa and dorsum, second confluent with a spot on tornus; an irregular transverse spot across wing towards apex, more or less confluent with tornal spot, and two small spots on costa before and beyond this: cilia whitish with a dark grey shade, round apex with a black basal line, and some black scales near base on terminal markings, towards tornus tinged with pale greyish-ochreous. Hindwings light blue-grey; cilia whitish-ochreous tinged with grey, at apex with a small grey spot at tips.

TRANSVAAL, Pretoria, in September and October (Janse); two specimens.

Pycnostola ochraula n.sp.

♂ 16 mm. Head white, with a few pale grey specks. Palpi white, second joint grey except apex, tuft very long, terminal joint anteriorly with a few grey specks. Thorax white speckled with grey. Abdomen grey, anal tuft whitish. Forewings elongate, narrow, costa slightly arched, apex acutely pointed, termen faintly sinuate, extremely oblique; grey, suffusedly irrorated with white and sprinkled with dark grey; a fulvous-ochreous subcostal line from near base to $\frac{2}{3}$, with a blackish dot beneath its extremity; a fulvous-ochreous line along fold throughout, marked with two black dots, the second being plical stigma; discal stigmata black, approximated, first very obliquely beyond plical, surrounded or almost connected with fulvous-ochreous; short fulvous-ochreous streaks above each of these, and a slender irregular fulvous-ochreous streak near and parallel to termen: cilia whitish-grey, with two faint dark lines. Hindwings light bluish-grey; cilia whitish-ochreous-grey.

TRANSVAAL, Pretoria, in September (Janse); one specimen. Nearly allied to *illuminata*, but distinguished by clear white head and suffusion of forewings.

Photodotis spilodoma n.sp.

♀ 13 mm. Head whitish. Palpi whitish, second joint sprinkled with dark fuscous except at apex, terminal joint with subapical band of dark fuscous irroration. Antennae whitish ringed with dark fuscous, terminal $\frac{2}{3}$ forming six dark fuscous bands separated by single whitish rings. Thorax whitish with a few dark fuscous scales. Abdomen ochreous-whitish sprinkled with fuscous. Forewings elongate, narrow, costa gently arched, apex obtuse, termen extremely obliquely rounded; 3 present; dark fuscous irrorated with whitish, dorsal area on anterior half of wing suffused with whitish-ochreous, anteriorly extending $\frac{2}{3}$ across wing; a blotch of blackish irroration representing plical and first discal stigmata, and a small spot on costa above it; a small brownish spot on tornus, connected by a cloudy blackish dot surmounted by a similar ochreous dot with indistinct dark second discal stigma; a small cloudy whitish spot on costa at $\frac{3}{4}$; two short ochreous streaks above and two below apex, separated by blackish irroration: cilia greyish, sprinkled with whitish and with base whitish on termen, with two darker grey shades. Hindwings grey; cilia light grey, base ochreous-whitish.

ZULULAND, Eshowe, in January (Janse); one specimen. Vein 3 of forewings is absent in type of genus, but this species is in all respects so closely allied that the discrepancy should evidently be disregarded.

Pycnodytis n.g.

Head with appressed scales; ocelli small, posterior; tongue developed. Antennae $\frac{5}{6}$, in ♂ simple, basal joint elongate, without pecten. Labial palpi long, recurved, second joint thickened with dense scales rather loose beneath and triangularly expanded with hairs on apical half above, terminal joint shorter than second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with rough hairs above. Forewings with 2-4 parallel, 6 and 7 out of 8, 7 to costa, 11 from middle. Hindwings under 1, narrow-trapezoidal, apex strongly produced, acute, termen emarginate, cilia 2; 2-5 remote, parallel, 6 and 7 approximated towards base.

Allied to *Aristotelia*, but palpi much as in *Trichotaphe*.

Pycnodytis erebaula n.sp.

♂ ♀ 11-12 mm. Head light grey, sidetufts tinged with brownish. Palpi dark fuscous, extreme apical edge of second joint white, terminal joint whitish, tip dark grey. Antennae dark grey, on apical half with four remote white dots. Thorax light grey more or less tinged with brownish. Abdomen pale grey. Forewings elongate-lanceolate, acute; dark fuscous, in one specimen with dorsal half suffused with brownish; stigmata black, plical obliquely before first discal, indistinct or obsolete: cilia grey, towards base suffusedly barred with dark fuscous. Hindwings and cilia light grey.

ZULULAND, Eshowe, in January (Janse); two specimens.

Aristotelia stipella Hübn.

♂ ♀ 5-6 mm. A small form with subbasal yellow blotch from dorsum broad and reaching nearly to costa, yellow spots beyond middle of dorsum and in disc at $\frac{2}{3}$ well-developed, in one specimen the whitish costal spot produced in an irregular streak to termen above tornus; I consider the examples

undoubtedly referable to the southern form of this European species, not previously recorded from Africa but easily overlooked.

NATAL, Durban, in August and December (Janse); three specimens.

Leuronoma n.g.

Head smooth; ocelli moderate, far posterior; tongue developed. Antennae $\frac{3}{4}$, basal joint elongate, without pecten. Labial palpi very long, recurved, second joint with appressed scales, hardly thickened, terminal joint as long as second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with long fine rough hairs above. Forewings with 2 from towards angle, 7 and 8 stalked, 7 to costa, 11 from middle. Hindwings 1, elongate-trapezoidal, termen slightly sinuate, cilia 1; 3-5 separate, rather approximated at base, 6 and 7 stalked.

Type *chlorotoma* Meyr. Besides the two following species I refer to this genus *zymotis* Meyr., in which species the terminal joint of palpi is shorter than the second, the termen of hindwings more sinuate, cilia $1\frac{1}{2}$. The genus is somewhat intermediate between *Telphusa* and *Aristotelia*.

Leuronoma chlorotoma n.sp.

♀ 16 mm. Head pale ochreous. Palpi whitish sprinkled with fuscous and dark fuscous. Thorax brownish mixed with grey, patagia suffused with pale ochreous, shoulders dark fuscous. Abdomen grey, apex whitish-ochreous. Forewings elongate, narrow, costa slightly arched, apex obtuse-pointed, termen extremely obliquely rounded; rosy-brown, somewhat mixed irregularly with grey and towards dorsum suffused with grey, all veins except towards dorsum marked with slender rather irregular whitish-ochreous lines; plical stigma cloudy, blackish: cilia ochreous-whitish, towards base faintly rosy-tinged, with basal and antemedian lines of black points, and two grey posterior lines. Hindwings light slaty-grey; cilia whitish-grey.

TRANSVAAL, Pretoria, in November (Janse); one specimen.

Leuronoma veterascens n.sp.

♀ 11-12 mm. Head and thorax light brownish. Palpi light brownish sprinkled with dark fuscous, terminal joint as long as second. Abdomen pale ochreous irrorated with grey. Forewings elongate, narrow, costa gently arched, apex pointed, termen very obliquely rounded; light brownish, irregularly sprinkled with dark fuscous and some blackish scales; stigmata blackish, plical rather obliquely before first discal; obscure opposite spots of dark fuscous irroration on costa and dorsum just beyond second discal: cilia light brownish, sprinkled with dark fuscous towards base. Hindwings grey; cilia light grey.

NATAL, Umkomaas and Stella Bush, in January (Janse); two specimens.

Epithectis lacunosa n.sp.

♂ ♀ 10 mm. Head whitish irrorated with dark grey or blackish, sidetufts slightly ferruginous-tinged. Palpi grey irrorated with black, second joint with white spot below middle and extreme tip white, terminal joint white with two blackish bands. Thorax grey-whitish tinged with ferruginous, shoulders blackish-grey. Abdomen light grey, two basal segments whitish-ochreous, anal tuft of ♂ whitish. Forewings elongate, narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; reddish-ochreous or ferruginous; markings grey irrorated with black; a narrow fascia from base of costa to dorsum before middle; a narrow oblique fascia from costa at $\frac{1}{4}$,

below middle running into a narrow fascia which runs from a flattened-triangular blotch on middle of costa to dorsum beyond middle and coalesces there with first fascia; a patch of irregular marbling towards costa posteriorly, connected by a very irregular blotch with dorsum before tornus, edged posteriorly by a white mark near dorsum: cilia grey, on termen mixed with black towards base. Hindwings slaty-grey; cilia grey.

ZULULAND, Nkwaleni, in January; TRANSVAAL, Pretoria, in February (Janse); two specimens.

Parapsectris ferulata n.sp.

♀ 13-14 mm. Head and thorax whitish irregularly sprinkled with dark fuscous. Palpi whitish, second and terminal joints each with base and supra-median band dark fuscous. Abdomen whitish-grey, second segment with a whitish-ochreous dorsal patch. Forewings elongate, narrow, costa gently arched, apex pointed, termen very obliquely rounded; fuscous irrorated with dark fuscous; a blackish dot at base of costa, and one almost at base above fold; a short very oblique whitish-ochreous streak from costa at $\frac{1}{3}$, preceded by a small blackish mark; a whitish-ochreous streak along fold from base to middle of wing, with a series of three small blackish marks, first on upper edge and the other two on lower; a very oblique whitish-ochreous streak from $\frac{2}{5}$ of costa to $\frac{3}{5}$ of disc, preceded by a series of three or four small blackish marks; three small whitish-ochreous spots or dots on costa towards apex, and an undefined streak along termen, accompanied by a marginal series of small groups of blackish scales: cilia light grey, irrorated with whitish and somewhat sprinkled with blackish. Hindwings slaty-grey; cilia light grey.

NATAL, Umkomaas and Verulam, in January (Janse); two specimens.

Gelechia fecunda n.sp.

♂ 9 mm. Head and thorax pale yellow-ochreous. Palpi whitish, second joint dark fuscous except apex, terminal joint shorter than second, with blackish subapical ring. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen very obliquely rounded; yellow-ochreous; costa finely dotted with black from base to a triangular cloudy blackish spot at $\frac{2}{3}$; a triangular spot of blackish-grey irroration on dorsum before tornus, slightly before costal spot; a small black dot representing plical stigma; some scattered blackish scales towards apex, and several undefined marginal dots of blackish irroration round apex and termen: cilia yellow-ochreous. Hindwings under 1, apex acutely produced; rather dark grey; cilia light grey.

NATAL, Umkomaas, in January (Janse); one specimen.

Gelechia revoluta n.sp.

♂ ♀ 10-11 mm. Head whitish sprinkled with dark fuscous. Palpi whitish, second joint with two bands of blackish irroration, terminal joint with apex and median band blackish. Thorax ochreous-whitish, slightly sprinkled with grey, shoulders and anterior margin more or less marked with dark fuscous. Abdomen grey, two basal segments whitish-ochreous. Forewings elongate, narrow, costa gently arched, apex tolerably pointed, termen extremely obliquely rounded; in ♂ with strong costal fold from base to near middle; whitish, irregularly and variably irrorated with grey; basal area suffused with pale ochreous; a blackish spot at base of costa; elongate blackish blotches on costa about $\frac{1}{3}$ and dorsum before middle, more or less connected posteriorly by an oblique blackish blotch in disc; an elongate blackish blotch on costa

before middle, beneath which is a round pale ochreous spot; stigmata black ringed with pale ochreous, plical slightly before first discal; a blackish spot on costa above second discal stigma, and a more or less developed blackish blotch on dorsum beneath and connected with it; apical area suffused with pale ochreous; some cloudy black dots on posterior part of costa and termen: cilia dark grey sprinkled with whitish points. Hindwings 1, apex considerably produced, pointed; grey; cilia grey.

ZULULAND, Nkwaleni, in January (Janse); four specimens.

Gelechia tetraleuca n.sp.

♀ 15 mm. Head and thorax white, patagia with a blackish stripe. Palpi white, base with some black scales. Abdomen whitish. Forewings elongate, narrow, costa gently arched, apex obtuse, termen rounded, very oblique; grey much suffused with black, especially through middle of disc, and towards dorsum near base; four white blotches, first elongate, extending along dorsum from $\frac{1}{4}$ to $\frac{3}{4}$, widest anteriorly and reaching half across wing, thence irregularly attenuated, second oval, beneath costa slightly beyond middle, third roundish, on tornus, fourth semioval, on costa towards apex; a slender irregular white streak along termen: cilia white. Hindwings slightly over 1, apex obtuse, termen hardly sinuate; whitish-grey; cilia grey-whitish.

ZULULAND, Eshowe, in January (Janse); one specimen.

Phthorimaea geomicta n.sp.

♀ 12 mm. Head and thorax rather dark brown, shoulders and anterior part of dorsum suffused with blackish. Palpi brown irrorated with dark fuscous, terminal joint with median ring and tip whitish-mixed. Abdomen light grey. Forewings elongate-lanceolate; 6 separate; brown irrorated with fuscous, with some whitish scales; some darker fuscous suffusion towards base, and forming a patch in disc at $\frac{1}{3}$, a small blackish spot on costa at $\frac{1}{4}$. discal stigmata small, black, approximated: cilia whitish-grey, sprinkled with dark fuscous on basal half, with indistinct cloudy dark basal dots on costa. Hindwings pale bluish-grey; cilia whitish-grey.

NATAL, New Hanover, in October (Janse); one specimen.

Phthorimaea pendens n.sp.

♀ 14 mm. Head white, crown with a few black specks. Palpi white, second joint tinged with ochreous and sprinkled with blackish, beneath with rather long rough hairscales, terminal joint loosely scaled, with two rings of blackish irroration. Thorax whitish, with a dot of black irroration in middle of anterior margin and three in a triangle posteriorly, patagia pale ochreous with two or three black specks. Abdomen ochreous-whitish. Forewings elongate, narrow, costa slightly arched, apex pointed, termen extremely obliquely rounded; reddish-ochreous, paler towards base, with a few scattered black scales; a blackish dot towards base above middle, one in middle beyond this, and one still further on beneath fold; an irregular oblique grey streak irrorated with black from costa at $\frac{1}{4}$ to below middle, interrupted beneath costa, angulated and continued upwards to costa at $\frac{3}{4}$, and a similar streak from middle of costa crossing this and also below middle angulated upwards to touch it again just beyond second discal stigma; stigmata rather large, black, plical somewhat before first discal, these placed on margins of angle of first streak, second discal on posterior arm of first streak; some grey irroration along upper half of termen: cilia pale ochreous, sprinkled with black near base. Hindwings light slaty-grey; cilia whitish-ochreous.

ZULULAND, Melmoth, in January (Janse); one specimen. The normal rough scaling of second joint of palpi is exaggerated into rather long hairscales in this species, and the loose scaling of terminal joint is also noticeable, but in all other particulars this species agrees well with *Phthorimaea*, and is properly referred there.

Polyhymno hostilis n.sp.

♀ 16 mm. Head white, centre of crown fuscous. Palpi white, second joint anteriorly dark fuscous. Thorax bronzy-brown, with five white stripes. Abdomen grey, anal tuft ochreous-whitish. Forewings elongate, narrow, costa slightly arched, apex strongly produced, acute, subfalcate, termen concave beneath apex, then obliquely rounded; bronzy-brown; a strong shining white median longitudinal streak from base to near termen, broadest beyond middle, whence it sends a line to termen above tornus, thence narrowed to a point; a fine costal line almost from base to middle, thence very obliquely to just above apex of median streak; a narrow subdorsal white streak from base of dorsum to tornus; an oblique white line from $\frac{4}{5}$ of costa, becoming silvery-metallic and angulated to form a short mark on termen beneath apex; above posterior part of this an ochreous streak running into apical projection; a wedgeshaped white spot before termen in middle, and some irregular white marking along termen: cilia white, on costa with two oblique dark fuscous marks at origin followed by a wedgeshaped dark fuscous spot, above apex with a basal dark fuscous mark followed by two oblique dark fuscous lines converging to apex, at apex with a grey anterior spot tipped with dark fuscous, beneath apex with a short black basal mark, below middle of termen with two dark fuscous subbasal dots, on tornal area light grey. Hindwings bluish-grey; cilia ochreous-whitish suffused with light grey towards base.

TRANSVAAL, Pretoria, in December (Janse); one specimen. Nearest *paracma*, but with costal white line almost reaching base.

Polyhymno intorta n.sp.

♀ 6 mm. Head ochreous-white. Palpi white, terminal joint with dark fuscous median band. Thorax dark fuscous with three white stripes. Forewings elongate, narrow, costa slightly arched, apex pointed, produced, termen sinuate beneath apex, then very obliquely rounded; blackish; two closely parallel whitish median lines from base, upper not reaching middle, lower continued along fold to tornus; a whitish dorsal line from base to tornus; a very oblique whitish streak from $\frac{2}{3}$ of costa and a very oblique whitish line from $\frac{1}{3}$ of dorsum, meeting at an acute angle in disc and produced to near termen, then shortly acute-angled back parallel to termen; a fine double dark fuscous line suffused with fulvous from $\frac{3}{4}$ of costa into apex, thence along termen to tornus, on costal portion margined on each side by fine whitish lines: cilia light grey, above apex with two wedgeshaped whitish marks separated and followed by black lines, at apex with a projecting black line, beneath apex with a short black basal mark and dark grey apical spot, beneath these with a whitish patch containing a slight brownish subbasal mark beneath. Hindwings violet-grey; cilia light grey.

NATAL, Umkomaas, in January (Janse); one specimen. The smallest species of the genus.

Anacamptis elaeocoma n.sp.

♂ 11-12 mm. Head whitish-ochreous. Palpi ochreous-whitish, second joint irrorated with dark fuscous on basal half, terminal joint with anterior

edge irrorated with dark fuscous on apical half. Thorax fuscous, sometimes tinged with whitish-ochreous dorsally. Abdomen fuscous, two basal segments pale ochreous, anal tuft whitish. Forewings elongate-lanceolate, apex rather produced, acute; 6 separate; dark fuscous finely irrorated with whitish; stigmata blackish, discal approximated, plical obliquely before first discal: cilia pale greyish-ochreous, towards base irrorated with dark fuscous, with median line of black points. Hindwings 1, apex very long-produced; light bluish-grey; cilia pale greyish-ochreous.

TRANSVAAL, Pretoria, in February and March (Janse); three specimens. Allied to *cirrhocoma*.

Anacampsis exsulata n.sp.

♂ 12 mm. Head ochreous-white. Palpi white, second joint black except apex, terminal joint with a fine black line on each side except towards base. Thorax blackish, with large ochreous-whitish posterior spot. Abdomen grey. Forewings elongate, narrow, costa gently arched, apex pointed, termen sinuate, oblique; 6 separate; blackish; a moderately broad irregular-edged ochreous-whitish dorsal streak from base to tornus, its upper edge rather triangular-prominent at middle and $\frac{3}{4}$ of length; a short oblique ochreous-white streak from costa at $\frac{1}{4}$; a triangular clear white spot occupying lower $\frac{2}{3}$ of termen: cilia light grey irrorated with whitish, on costa dark grey with a basal line of white irroration becoming a subbasal white line on upper part of termen. Hindwings 1, termen sinuate, apex pointed; grey; cilia light grey.

ZULULAND, Eshowe, in January (Janse); one specimen. This very interesting insect is of South American type, quite unlike any *Anacampsis* from other regions; the genus is very largely developed in South America.

Acompsia eodryas n.sp.

♂ ♀ 11-12 mm. Head whitish-ochreous. Palpi ochreous-whitish, second and terminal joints each with two bands of dark fuscous irroration. Thorax whitish-ochreous, patagia partially or almost wholly brown. Abdomen grey-whitish. Forewings elongate, narrow, costa slightly arched, apex pointed, termen extremely obliquely rounded; pale ochreous-yellowish, dorsal area variably tinged or mixed with brown; a narrow rosy-brown fascia from base of costa to dorsum before middle, marked with black on fold; a similar fascia from $\frac{1}{3}$ of costa to dorsum before tornus, thence angulated upwards to costa before apex; the costal space enclosed by this forms a rosy-brown triangular blotch separated from it by a slender streak of ground-colour sometimes interrupted at its apex; stigmata black, on margin of angulated fascia, plical somewhat before first discal, second discal sometimes absent, a black mark also on dorsal angle of fascia; costal edge of these markings more or less tinged with blackish; an irregular line of black and rosy-brown scales along termen: cilia pale grey with rows of whitish points, on termen tinged with rosy and mixed with black towards base. Hindwings bluish-grey, lighter anteriorly; cilia light grey.

ZULULAND, Nkwaleni, in January; TRANSVAAL, Pretoria, in April (Janse); three specimens. The single Pretoria specimen sent has terminal joint of palpi only $\frac{1}{3}$ of second (instead of $\frac{2}{3}$), suffused with blackish, but as it is entirely similar otherwise, I regard the structure as probably an individual abnormality or deformity. The name *Acompsia* Hübn. is here employed for the genus to which in my *Handbook of British Lepidoptera* the name *Recurvaria* Haw. was wrongly applied.

Anarsia subfulvescens n.sp.

♂ 10 mm. Head and thorax whitish. Palpi dark fuscous, apical edge irrorated with white. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen very obliquely rounded; pale fuscous, finely and closely irrorated with white, with a few scattered black scales; an elongate black mark on middle of costa, and short fine black strigulae on costal edge near before and beyond it; some small groups of black specks on termen: cilia grey irrorated with whitish. Hindwings grey, thinly scaled anteriorly; cilia light grey. Wings beneath tinged with yellowish-fulvous towards base, especially hindwings, where it is prolonged on veins to middle.

NATAL, Umkomaas, in January (Janse); one specimen.

Anarsia vectaria n.sp.

♂ ♀ 8-13 mm. Head and thorax grey-whitish, shoulders narrowly black. Palpi white, second joint dark fuscous except apex, tuft yellowish, terminal joint with three dark fuscous rings. Abdomen in ♂ whitish, sides dark fuscous, anal tuft whitish-yellowish. Forewings elongate, narrow, costa gently arched, apex obtuse, termen very obliquely rounded; pale grey finely irrorated with white; small black dots on costa at base and $\frac{1}{3}$, and one towards costa near base; a triangular blackish blotch extending on costa from $\frac{1}{3}$ to $\frac{2}{3}$ and nearly reaching fold, its apex subtruncate; a small black dot below fold near before apex of this; some indistinct blackish-grey dots round apical part of costa and termen: cilia grey sprinkled with whitish. Hindwings with costa in ♂ dilated on basal half; subhyaline-prismatic, posteriorly suffused with dark grey, veins dark grey; cilia light grey. Forewings beneath with long whitish expandible hair pencil from base below cell, lying beneath expansion of hindwings.

NATAL, Sarnia (Mrs Curry), Umkomaas (Janse), in November and January; two specimens.

Anarsia spicata n.sp.

♂ 13-14 mm. Head, palpi, and thorax light grey irrorated with whitish, patagia blackish, tuft of palpi suffused with dark fuscous towards apex. Abdomen light grey, sides blackish, anal tuft whitish, above brown. Forewings elongate, narrow, costa gently arched, apex tolerably pointed, termen very obliquely rounded; grey irrorated with whitish, with some scattered dark grey and blackish scales; a thick black submedian streak from base to middle, attenuated to a point, a median streak attenuated at both ends from before middle of disc to $\frac{2}{3}$, and an oblique dash from above apex of this to costa before apex: cilia light grey irrorated with whitish, round apex barred with dark grey basally. Hindwings grey, paler and thinly scaled anteriorly; cilia pale grey.

TRANSVAAL, Pretoria, in November and December (Janse); two specimens.

Chelaria loxosaris n.sp.

♂ 17 mm. Head ochreous-whitish sprinkled with pale grey. Palpi ochreous-whitish, second joint with long broad subtriangular tuft, suffused with dark fuscous except along apical margin, terminal joint thickened with loose scales almost to apex, with two oblique subconfluent bands of blackish irroration above middle and a ring towards base. Thorax whitish irrorated with pale grey. Abdomen grey, anal tuft large, whitish-ochreous. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely

rounded; 6 separate; fuscous finely and closely irrorated with white, with some scattered blackish scales; three or four blackish dots towards base; a small obliquely elongate dark fuscous spot on middle of costa, two small costal marks anterior to this and two posterior, all separated with whitish suffusion on costal edge; plical and second discal stigmata black; a series of cloudy dark fuscous marginal dots round posterior part of costa and termen: cilia fuscous or brownish irrorated with whitish, basal half indistinctly spotted with dark fuscous. Hindwings grey, darker posteriorly; cilia light fuscous. Forewings beneath with a long expansible fuscous hair-pencil from near base of dorsum extending obliquely upwards across disc.

NATAL, Umkomaas, in January (Janse); two specimens.

Chelaria austerodes n.sp.

♂ 16 mm. Head shining grey sprinkled with whitish. Palpi dark grey mixed with black and sprinkled with whitish, second joint with large broad tuft, with black median band and suffused with whitish basally, terminal joint with posterior scale-projection towards apex. Thorax blackish, patagia fuscous. Abdomen fuscous. Forewings elongate, narrow, costa gently arched, apex obtuse-pointed, termen extremely obliquely rounded; 6 separate; dark grey irregularly sprinkled with whitish, with scattered small blackish tufts and dashes; a longitudinal ochreous-brown mark near base in middle; seven or eight small oblique blackish spots along costa; an erect-oval spot of ground colour above tornus edged on upper half with blackish and on lower with whitish; some blackish marking along termen: cilia dark grey sprinkled with whitish (imperfect). Hindwings dark grey, thinly scaled and whitish-tinged anteriorly, with hyaline streaks in and beneath cell; cilia light fuscous.

TRANSVAAL, Pretoria, in March (Janse); one specimen.

Lachnostola n.g.

Head smooth, sidetufts somewhat raised; ocelli small, far posterior; tongue developed. Antennae $\frac{3}{4}$, basal joint elongate, without pecten. Labial palpi long, recurved, second joint thickened with scales, forming a long projecting triangular apical tuft beneath, terminal joint as long as second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with hairs above. Forewings with *1b* furcate, 2 from $\frac{2}{5}$, 3 and 4 closely approximated from angle, 6 and 8 stalked, 7 absent, 11 from middle. Hindwings under 1, elongate-trapezoidal, apex produced, pointed, termen sinuate, cilia 1 $\frac{3}{4}$; 3 and 4 connate, 5 nearly approximated, 6 and 7 stalked.

Appears to be a development of *Nothris*.

Lachnostola amphizeucta n.sp.

♀ 8-11 mm. Head and thorax whitish-yellowish, shoulders dark fuscous. Palpi yellow-whitish, second joint dark fuscous except towards apex. Abdomen grey. Forewings elongate, narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; pale ochreous-yellowish; a narrow dark fuscous streak along costa from base to $\frac{2}{5}$; a dark fuscous streak along dorsum from near base to $\frac{3}{4}$; a deep ochreous spot surrounded with blackish suffusion resting on this before middle of wing; a triangular dark grey blotch extending on costa from middle to $\frac{3}{4}$ and reaching half across wing; discal stigmata blackish, second just below apex of costal blotch; more or less yellow-ochreous suffusion towards tornal area, with scattered blackish scales; an apical spot of blackish

suffusion: cilia pale ochreous-yellowish, with a dark grey spot above apical spot. Hindwings grey; cilia light grey.

NATAL, Umkomaas (Janse), New Hanover (Hardenberg), in September, January, and March; three specimens.

Dichomeris stromatias n.sp.

♂ 19 mm. Head and thorax crimson-whitish-grey. Palpi whitish-ochreous, second joint blackish except apex, with short rounded apical tuft beneath and scales expanded towards apex above, terminal joint somewhat longer than second. Abdomen grey, anal tuft pale ochreous. Forewings elongate, rather narrow, posteriorly slightly dilated, costa slightly arched, apex obtuse, termen straight, rather oblique; dull greyish-crimson; costal edge yellow-ferruginous from near base to near apex; stigmata indicated by whitish dots, second discal by two longitudinally placed, plical rather obliquely before first discal: cilia whitish-grey-crimson, more rosy-tinged towards base. Hindwings grey, veins darker; cilia grey, base pale.

ZULULAND, Nkwaleni, in January (Janse); one specimen.

Trichotaphe conclusa n.sp.

♂ 13 mm. Head and thorax yellow-ochreous. Palpi rather dark bluish-fuscous, second joint expanded with rough scales above, yellowish internally and on anterior edge, terminal joint half second, tip whitish. Abdomen grey, anal tuft light ochreous-yellowish. Forewings elongate, rather narrow, posteriorly hardly dilated, costa gently arched, apex obtuse, termen straight, somewhat oblique; deep yellow-ochreous, slightly ferruginous-tinged, and with a slight violet gloss; costal edge blackish towards base; plical and first discal stigmata small, blackish, plical slightly posterior; a narrow blackish terminal fascia from apex to tornus, pointed beneath, with black dots on terminal edge: cilia fulvous-ochreous, outer half dark grey on termen, on tornus with a grey bar. Hindwings rather dark grey; cilia grey, extreme base whitish.

NATAL, Umkomaas, in January (Janse); one specimen.

Trichotaphe byrsoxantha n.sp.

♀ 17 mm. Head and thorax ochreous-orange. Palpi pale ochreous, second joint fuscous except apex, with triangularly expanded scales above beyond middle, terminal joint somewhat longer than second. Forewings elongate, rather narrow, posteriorly slightly dilated, costa moderately arched, towards middle nearly straight, apex rounded-obtuse, termen rounded, little oblique; ochreous-orange tinged with ferruginous; stigmata dark fuscous, discal approximated, transverse, first rather oblique, plical dot-like, beneath first discal; a terminal series of dark fuscous dots; cilia ochreous-orange. Hindwings grey; cilia pale yellowish, on lower half of termen suffused with pale grey.

NATAL, Umkomaas, in January (Janse); one specimen.

Trichotaphe hortulana n.sp.

♂ 12 mm. Head bronzy. Palpi ochreous-whitish, second joint ochreous except apical edge, with scales triangularly expanded above, terminal joint much longer than second. Thorax grey mixed with ochreous, with a bronzy-ochreous stripe on each side of back. Abdomen dark grey. Forewings elongate, narrow, costa hardly arched, apex obtuse, termen slightly rounded, oblique; dark iron-grey; markings fulvous-ochreous; an irregular basal patch, not

reaching costa; a transverse fasciate blotch from dorsum before middle, edged with lighter, apex rounded, not reaching costa; an outwards-oblique fasciate blotch from middle of costa, edged with lighter, reaching $\frac{2}{3}$ across wing, towards costa suffused with blackish; a straight slightly inwards-oblique transverse line from costa at $\frac{3}{4}$, apical area beyond this suffused with blackish, with cloudy black marginal dots: cilia leaden-grey, on apex and upper part of termen mixed with whitish-ochreous. Hindwings dark grey; cilia grey.

TRANSVAAL, Pretoria, in November (Janse); one specimen.

Trichotaphe turgida n.sp.

♀ 18 mm. Head and thorax whitish-ochreous, shoulders slenderly black. Palpi whitish, second joint with rough projecting scales at apex beneath and strongly triangularly expanded with rough scales above, dark fuscous except apex, terminal joint much longer than second. Abdomen grey. Forewings elongate, narrow-oblong, costa strongly arched anteriorly, sinuate towards middle, slightly arched posteriorly, apex nearly rectangular, termen faintly sinuate, little oblique; 7 to apex; whitish-ochreous; a small black mark on base of costa; stigmata small, dark fuscous, first discal represented by a short linear dash, plical slightly beyond this; costa slenderly dark fuscous from $\frac{2}{3}$ to apex, cut by a whitish line which runs from $\frac{2}{3}$ of costa to near apex and thence strongly curved to tornus, and posteriorly by three oblique whitish strigulae; a fine whitish terminal line marked with several small blackish dots, space between this and preceding line brownish-tinged: cilia whitish-ochreous (imperfect). Hindwings with 5 widely remote from 4, parallel; grey; cilia light greyish, with darker subbasal shade.

ZULULAND, Eshowe, in January (Janse); one specimen.

Lecithocera binotata n.sp.

♂ 11 mm. Head ochreous-yellowish, crown centrally suffused with purplish-fuscous. Palpi pale yellowish, second joint externally fuscous except towards base, terminal joint anteriorly dark fuscous. Antennae pale yellowish, ringed with pale fuscous. Thorax fuscous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen obliquely rounded; 2 and 3 connate, 4 and 5 stalked, 8 and 9 out of 7; fuscous sprinkled with dark fuscous; discal stigmata rather large, blackish: cilia pale fuscous, with two darker shades. Hindwings grey; cilia light grey.

NATAL, Umkomaas, in January (Janse); one specimen.

Dragmatucha obseptata n.sp.

♂ 17 mm. Head whitish. Palpi ochreous-whitish, second joint without tuft, basal third dark fuscous, terminal joint with blackish lateral line. Thorax ochreous-whitish, with black patch on shoulders, and a black stripe on each side of back. Abdomen whitish-ochreous. Forewings elongate, rather narrow, posteriorly dilated, costa gently arched, towards middle slightly sinuate, apex obtuse-pointed, termen faintly sinuate, rather oblique; 3 and 4 out of 2; whitish, costa and edge of markings tinged with ochreous-yellow; markings blackish; a spot on base of costa; an irregular-edged straight transverse streak at $\frac{1}{4}$; a very broad postmedian fascia, narrowed towards dorsum, marked with three longitudinal whitish streaks, pointed at each end; a slightly incurved streak from costa near termen to tornus; a slender terminal streak: cilia shining ochreous-whitish, at apex with a blackish bar. Hindwings ochreous-whitish; an inwards-oblique cloudy mark of dark fuscous irroration tinged

with ochreous from costa at $\frac{4}{5}$, and a more blackish mark on apical part of termen; cilia whitish, with faint ochreous-yellowish subbasal shade, at apex with a blackish bar.

ZULULAND, Prospect, in January (Janse); one specimen. This and the following differ from the typical species in absence of tuft of palpi, and presence of vein 3 of forewings, but are entirely congeneric, the genus being distinct by other characters.

Drigmatucha biviva n.sp.

♂ 22 mm. Head and thorax dark purplish-fuscous, sides of head pale ochreous-yellowish. Antennae whitish-ochreous. Palpi pale ochreous-yellowish, second joint with appressed scales. Abdomen light greyish, anal tuft pale yellowish. Forewings elongate, rather narrow, costa anteriorly moderately, posteriorly slightly arched, apex obtuse, termen faintly sinuate, rather oblique; 3 and 4 out of 2; dark purplish-fuscous; a nearly straight whitish-ochreous transverse streak at $\frac{1}{4}$; a nearly straight whitish-ochreous line from costa near apex to dorsum before tornus: cilia dark grey, with faint whitish median line on termen. Hindwings grey, darker towards apex; a small ochreous-white spot on costa near apex, whence a cloudy whitish line runs near termen to below its middle; cilia grey, with cloudy whitish median line on termen to below middle.

NATAL, Drummond, in December (Janse); one specimen.

Onebala homogramma n.sp.

♀ 13 mm. Head whitish-ochreous, crown centrally suffused with bronzy-fuscous. Palpi whitish-ochreous, second joint suffused with bronzy-fuscous except apex, terminal joint with incomplete dark fuscous line on each side. Thorax dark purplish-fuscous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, faintly sinuate in middle, apex obtuse, termen slightly rounded, oblique; 3 absent, 2 and 4 stalked, 7 absent, 8 and 9 stalked; dark purplish-fuscous; a somewhat irregular straight transverse whitish-ochreous line at $\frac{2}{5}$, somewhat expanded on costa; a small whitish-ochreous spot on costa at $\frac{4}{5}$, whence a fine somewhat curved line of scattered whitish-ochreous scales runs to dorsum before tornus: cilia grey with obscure darker subbasal line, base marked with whitish-ochreous at and beneath apex. Hindwings and cilia grey.

NATAL, Umkomaas, in January (Janse); two specimens. Very similar to *chlorotoma*, and best distinguished by the quite different neuration.

Brachmia dryadopa n.sp.

♂ ♀ 14-15 mm. Head fuscous, face whitish-ochreous. Palpi whitish-ochreous, slightly sprinkled with grey. Thorax rather dark fuscous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen slightly rounded, somewhat oblique; dark purplish-ashy-fuscous; stigmata represented by small round ochreous-brownish spots more or less strongly centred with dark fuscous; a cloudy ochreous-whitish spot on costa at $\frac{3}{4}$: cilia dark grey. Hindwings and cilia grey.

NATAL, Umkomaas, in January (Janse); COMORO Is., Mayotte, in June (Leigh); three specimens.

Brachmia octophora n.sp.

♂ 11-12 mm. Head shining leaden-grey. Palpi ochreous-yellow. Thorax shining leaden-grey, with a slender orange stripe on each side of back. Abdomen

grey, anal tuft ochreous-whitish. Forewings elongate, narrow, costa gently arched, apex obtuse, termen nearly straight, rather oblique; shining leaden-grey; an irregular outwards-oblique orange fascia from base of dorsum, not reaching costa; a deep bronzy blackish-edged transverse blotch from dorsum somewhat before middle, broadest on dorsum, reaching $\frac{3}{4}$ across wing, apex rounded and margined by a crescentic orange streak; an 8-shaped orange patch filled up with fuscous, entirely crossing wing beyond middle from costa to dorsum, edged with blackish; a rather curved orange line from $\frac{4}{5}$ of costa to just before tornus, strongly indented in middle, edged anteriorly with irregular black scales and posteriorly with blackish suffusion: cilia whitish, with black basal line, beneath tornus light grey. Hindwings grey; cilia light grey.

NATAL, Stella Bush, in December (Janse); two specimens.

Brachmia fiscinata n.sp.

♂ 10 mm. Head whitish-ochreous, face more whitish. Palpi ochreous-whitish sprinkled with dark fuscous. Thorax whitish-ochreous irregularly marked with dark fuscous irroration. Abdomen grey, anal tuft whitish. Forewings elongate, narrow, costa slightly arched, apex obtuse-pointed, termen obliquely rounded; ochreous-whitish, marked between veins with brown lines irrorated with dark fuscous, less marked and incomplete on costal $\frac{2}{5}$, strong on rest of wing, especially two terminating beneath apex in a suffused terminal spot; very oblique suffused dark fuscous lines from costa at $\frac{1}{5}$, $\frac{2}{5}$, and $\frac{4}{5}$, crossing costal $\frac{2}{5}$; stigmata small, dark fuscous, slightly edged with whitish, plical somewhat before first discal: cilia dark grey, basally obscurely barred with grey-whitish, on costa whitish-ochreous. Hindwings grey; cilia light grey.

ZULULAND, Nkwaleni, in January (Janse); one specimen.

Syrmadaula n.g.

Head with appressed scales; ocelli small, posterior; tongue developed. Antennae $\frac{3}{4}$, in ♂ very shortly ciliated, basal joint rather elongate, without pecten. Labial palpi long, recurved, second joint thickened with appressed scales, somewhat rough beneath, terminal joint as long as second, moderate, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with rough hairscales above. Forewings with 2 and 3 short-stalked from angle, 4 and 5 somewhat approximated, 7 absent, 11 from middle. Hindwings somewhat under 1, elongate-trapezoidal, termen beneath apex very oblique, slightly sinuate, cilia 1; 3-5 equidistant, remote, 6 and 7 stalked.

Allied to *Autosticha*.

Syrmadaula automorpha n.sp.

♂ ♀ 13-14 mm. Head light yellow-ochreous. Palpi pale ochreous, second joint dark fuscous except tip, terminal joint sprinkled with dark fuscous towards apex. Thorax fuscous. Abdomen brownish-grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse-pointed, termen very obliquely rounded; light fuscous irrorated with dark fuscous; stigmata moderate, dark fuscous, plical somewhat obliquely before first discal; a dark fuscous dot near dorsum at $\frac{3}{4}$; three or four cloudy dark fuscous dots on termen: cilia pale fuscous, on basal half sprinkled with dark fuscous. Hindwings grey; cilia pale grey.

TRANSVAAL, Pretoria, in September and January (Janse); four specimens.

METACHANDIDAE

Daemonarcha n.g.

Head with appressed scales, sidetufts large, raised, meeting and projecting on forehead; ocelli small, posterior; tongue developed. Antennae $\frac{5}{3}$, in ♂ serrate, minutely ciliated, basal joint elongate, without pecten. Labial palpi very long, curved, obliquely ascending, second joint very long, much thickened with dense scales and above expanded with rough projecting scales throughout, terminal joint less than half second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with hairs above. Forewings with 1*b* furcate, 2 and 3 stalked from angle, 4 and 5 approximated to them at base, 7 absent, 8 and 9 stalked, 11 from middle. Hindwings 1, elongate-trapezoidal, termen somewhat sinuate beneath apex, cilia nearly 1; cell less than half wing, 3 and 4 connate, 5 somewhat approximated, 6 absent.

Allied to *Ancylometis*.

Daemonarcha cyprophanes n.sp.

♂ 14–15 mm. Head and thorax deep purple. Palpi dark purple-bronzy-grey. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen obliquely rounded; deep blue-purple, towards apex and termen becoming bright coppery; a faint oblique coppery strigula on costa at $\frac{3}{4}$: cilia purple-coppery, towards tornus dark grey. Hindwings and cilia grey; a fine groove along lower margin of cell continued between 3 and 4 to termen.

NATAL, Umkomaas and Verulam, in January (Janse); two specimens.

COSMOPTERYGIDAE

Labdia caulota n.sp.

♂ ♀ 17–19 mm. Head white, in ♀ with dark fuscous median line on crown. Palpi white, second joint thickened and roughened with scales beneath, with basal half dark fuscous and a faint fuscous subapical ring, terminal joint slightly roughened with scales anteriorly, with indistinct dark fuscous subbasal and subapical rings. Thorax white, patagia and a median streak not reaching posterior extremity dark fuscous. Abdomen dark fuscous, segmental margins white. Forewings lanceolate, apex considerably produced, acute; 6 and 7 out of 8; dark fuscous; a white streak from base for a short distance along costa, thence very obliquely to $\frac{2}{3}$ of disc, extremities pointed; a white streak from $\frac{1}{3}$ of costa to $\frac{4}{5}$ of costa, slightly downcurved and enclosing a slender costal streak of ground-colour; a slender irregular white dorsal streak from base to beyond tornus; a white apical dash: cilia whitish-grey, round apex darker grey, on end of costal streak white. Hindwings pale blue-grey; cilia ochreous-whitish.

ZULULAND, Eshowe, in January (Janse); NATAL, Pinetown, in February (Leigh); two specimens.

Limnoecia effulgens n.sp.

♂ 12 mm. Head pale shining brassy-bronze. Palpi orange-yellow, anterior edge of terminal joint blackish. Antennae dark fuscous, apical fifth whitish. Thorax deep indigo-purplish. Abdomen dark fuscous. Forewings elongate-lanceolate; dark fuscous becoming bright deep purple posteriorly, basal area

suffused with dark indigo, extended dorsally to a purplish patch on middle of dorsum reaching $\frac{3}{4}$ across wing and suffused with greenish in disc; a very indistinct whitish mark on fold before $\frac{1}{3}$ of wing; a transverse white mark on middle of costa, and another towards dorsum at $\frac{2}{3}$ of wing, dorsal edge from middle to this suffused with coppery-golden: cilia dark grey, basally scaled with purple on termen. Hindwings dark fuscous; cilia dark grey.

ZULULAND, Eshowe, in January (Janse); one specimen.

Cholotis melanogastra n.sp.

♂ 8 mm. Head and thorax dark bronzy-fuscous, slightly whitish-speckled. Palpi dark fuscous speckled with whitish. Abdomen blackish, segmental margins slenderly pale grey. Forewings lanceolate; dark fuscous, slightly and very minutely whitish-speckled; plical and second discal stigmata indistinct, blackish: cilia grey mixed with dark fuscous and minutely speckled with whitish. Hindwings $\frac{1}{3}$, rather dark grey, suffused with blackish from near base to beyond middle; cilia light grey.

ZULULAND, Nkwaleni, in January (Janse); one specimen. The characteristic blackish abdomen and suffusion of hindwings may probably be confined to the male.

Cholotis cardinata n.sp.

♂ 8 mm. Head and thorax dark fuscous, face leaden-grey. Palpi dark fuscous speckled with white, apex of second joint white. Abdomen dark grey. Forewings elongate-lanceolate; grey with bases of scales ochreous-whitish, towards costa and posteriorly wholly suffused with dark purplish-fuscous; a narrow black basal fascia, sharply edged with pale ochreous suffusion; stigmata rather large, black, plical obliquely before first discal; cloudy whitish opposite dots on costa at $\frac{2}{3}$ and tornus; cilia grey suffused with dark fuscous round apical area. Hindwings grey; cilia light grey.

NATAL, Umkomaas, in January (Janse); one specimen.

Batrachedra ledereriella Zell.

TRANSVAAL, Pretoria, in October, November, and February (Janse). This South European species has not previously been recorded from South Africa.

Trachydora iocharis n.sp.

♂ 15 mm. Head white. Palpi white, second joint infuscated towards base. Thorax white, with a blackish spot on shoulders and a dorsal dot anteriorly. Forewings elongate-lanceolate; ochreous-white; some blackish suffusion on base of costa; a small blackish dot near base below middle; some irregular undefined ferruginous-ochreous suffusion extending from about $\frac{1}{4}$ of disc to apex, in one specimen little developed; a black dot beneath fold at $\frac{2}{3}$ (plical stigma); an oval spot of black irroration in middle of disc, in one specimen reduced to a dot (first discal stigma), and a transverse spot on tornus reaching half across wing and including second discal stigma; cilia whitish-ochreous, towards base tinged with ferruginous. Hindwings pale grey or whitish-grey; cilia whitish-ochreous.

ZULULAND, Eshowe; NATAL, Drummond (Janse); in January, two specimens.

OECOPHORIDAE

Promalactis scalmotoma n.sp.

♂ 9 mm. Head and thorax bronzy, face white. Palpi fulvous, terminal joint blackish, tip white. Antennae white ringed with black, ciliations 1. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex tolerably pointed, termen very obliquely rounded; bronzy-fulvous; markings white edged with some black scales; a fine line from base of fold to $\frac{1}{3}$ of dorsum; a rather curved line from near base in middle to dorsum before middle; an oblique line from dorsum at $\frac{2}{3}$, almost reaching apex of a slightly inwards-oblique subtriangular spot on costa at $\frac{2}{3}$ reaching half across wing; a small irregular apical spot, and a very minute dot on termen beneath it; a minute white dot on tornus: cilia light bronzy-fulvous. Hindwings with 4 apparently absent; grey; cilia light grey.

ZULULAND, Eshowe, in January (Janse); one specimen.

Schiffermuelleria pedicata n.sp.

♂ ♀ 12–15 mm. Head and thorax bronzy-orange. Palpi orange, apical half of terminal joint black with anterior edge white. Antennae white ringed with black, ciliations in ♂ 1. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex tolerably pointed, termen nearly straight, rather strongly oblique; deep bronzy-orange, lighter towards costa anteriorly; markings white finely edged with black; fine subdorsal and plical lines on basal fifth; a fine line from towards costa near base to disc at $\frac{2}{3}$, thence angled inwards (more acutely in ♂) to near $\frac{1}{4}$ of dorsum, curved round and continued near dorsum to middle, then obliquely upwards to disc beyond middle, then somewhat downwards and again angled upwards to join a spot on costa at $\frac{3}{4}$, which is orange-yellow in ♂ and white in ♀; a short oblique mark before tornus, a very short mark on tornus, and a marginal row of dots round apex and termen, these markings in ♀ surrounded with blackish suffusion: cilia pale orange, deeper towards base. Hindwings rather dark grey, lighter towards base; cilia light grey.

ZULULAND, Melmoth, and NATAL, Drummond, in January (Janse); two specimens.

Schiffermuelleria helminthias n.sp.

♀ 9–11 mm. Head and thorax golden-bronze. Palpi ochreous-orange, terminal joint white with a few blackish scales. Antennae white ringed with blackish. Abdomen whitish-grey. Forewings elongate, rather narrow, costa gently arched, apex tolerably pointed, termen very obliquely rounded; golden-ochreous-orange; markings white, finely edged with black irroration; a straight line from base to $\frac{1}{4}$ of dorsum; a line from near base in middle, running in an upward curve to near dorsum before middle, thence curved round to disc beyond middle, and again angulated downwards to a small spot on dorsum before tornus; a somewhat irregular transverse streak from $\frac{2}{3}$ of costa, nearly reaching praeternal spot; a more or less interrupted line along upper part of termen, not black-margined anteriorly: cilia light golden-ochreous-orange. Hindwings light grey or whitish-grey; cilia whitish.

NATAL, Umkomaas, and ZULULAND, Prospect, in January (Janse); two specimens.

Chirocompa decurrens n.sp.

♂ 7 mm. Head shining white, back of crown and thorax dark bronzy-brown. Palpi fulvous-ochreous, terminal joint lined with blackish. Abdomen grey. Anterior tibiae and tarsi black dotted with white. Forewings elongate, narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; chestnut-brown, suffused with fuscous towards costa, termen, and base of dorsum; a white line with a few black scales on edges running from base of costa to dorsum before middle, thence along dorsum to $\frac{3}{4}$, whence it runs obliquely up to join a large quadrate snow-white spot on costa at $\frac{3}{4}$, this portion and spot edged posteriorly with black irroration: cilia light bronzy-brownish. Hindwings grey; cilia light greyish.

NATAL, Umkomaas, in January (Janse); one specimen.

Opsigenes n.g.

Head smooth, sidetufts loosely raised; ocelli posterior; tongue developed. Antennae $\frac{4}{5}$, basal joint elongate, without pecten. Labial palpi long, recurved, second joint somewhat thickened and slightly rough towards apex beneath, terminal joint as long as second, slender, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with hairs above. Forewings with 2 from $\frac{5}{8}$, 3 and 4 approximated from near angle, 7 to costa, 8 absent, 11 from middle. Hindwings $\frac{3}{4}$, narrow-lanceolate, cilia $2\frac{1}{2}$; 3 and 4 connate, 5 absent, 6 and 7 rather approximated.

Opsigenes parastacta n.sp.

♀ 7-8 mm. Head ochreous-whitish. Palpi ochreous-whitish, second joint dark fuscous except apex. Thorax dark fuscous. Abdomen grey. Forewings lanceolate; dark fuscous; stigmata blackish, sometimes edged posteriorly with whitish, plical obliquely before first discal; a similar dot on dorsum towards tornus; some scattered whitish scales towards apex: cilia grey sprinkled with dark fuscous. Hindwings and cilia light grey.

NATAL, Umkomaas, in January (Janse); seven specimens.

Hyalochma n.g.

Head with appressed hairs, sidetufts somewhat raised; ocelli small, posterior; tongue developed. Antennae $\frac{3}{2}$, in ♂ evenly ciliated ($\frac{3}{2}$), basal joint elongate, with pecten. Labial palpi moderately long, recurved, second joint thickened with appressed scales, not reaching base of antennae, terminal joint $\frac{3}{4}$ of second, moderate, pointed. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with long rough hairs above. Forewings with 1 *b* furcate, 2 and 3 stalked from angle, 7 and 8 stalked, 7 to costa, 11 from before middle. Hindwings 1, trapezoidal-ovate, termen slightly sinuate, cilia $\frac{3}{2}$; an elongate hyaline striated spot beneath cell before 2; 3 and 4 rather remote, 4 from angle, 5 rather curved, remote from 4, 6 and 7 parallel.

Allied to *Allotalanta*.

Hyalochma allevata n.sp.

♂ 27 mm. Head yellow-ochreous, sidetufts slightly mixed with fuscous. Palpi yellow-ochreous, base of second joint somewhat infuscated. Thorax brownish-ochreous, patagia rather mixed with fuscous, dorsum mostly occupied by a large dark fuscous blotch. Abdomen ochreous somewhat mixed with grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse,

termen slightly rounded, oblique; brownish, with faint violet tinge; basal third somewhat marked irregularly with light yellow-ochreous; stigmata cloudy, fuscous, irregularly ringed with light yellow-ochreous, plical rather obliquely beyond first discal, second discal represented by an irregular linear transverse mark, nearly followed by two dots; a cloudy pale ochreous mark in disc towards apex indicating angle of a subterminal line; an almost marginal series of light yellow-ochreous marks round posterior part of costa and termen: cilia ochreous-yellowish, with a basal series of spots of fuscous and dark fuscous suffusion. Hindwings grey, basal third and apical edge suffused with pale yellowish; cilia pale yellowish.

NATAL, Umkomaas, in January (Janse); one specimen.

Protomacha conservata n.sp.

♂ 18 mm. Head whitish-grey. Palpi white, second joint dark grey except above and at apex. Thorax grey. Abdomen grey mixed with whitish. Forewings elongate, costa gently arched, apex obtuse, termen slightly rounded, oblique; grey; a moderate white streak along costa from base to $\frac{2}{3}$, finely attenuated posteriorly; stigmata small, blackish, plical beneath first discal; a few blackish scales indicating an angulated subterminal series of dots near margin: cilia whitish-grey. Hindwings light grey; cilia whitish-grey.

CAPE COLONY, Port Elizabeth, in November (Fitzsimons); one specimen.

Depressaria orthobathra n.sp.

♂ ♀ 15-18 mm. Head ochreous-whitish, collar suffused with brownish-grey. Palpi ochreous-whitish, second joint sprinkled with blackish, terminal joint with slight basal and supramedian rings of blackish irroration. Thorax brownish-grey sprinkled with blackish. Abdomen grey-whitish irrorated with blackish, anal tuft of ♂ whitish. Forewings elongate, posteriorly slightly dilated, costa gently arched, apex rounded, termen rounded, somewhat oblique; 2 and 3 stalked; whitish-ochreous or light greyish-ochreous, with some small scattered dark fuscous strigulae; base narrowly dark ash-grey mixed with black, edge direct; first discal stigma small, blackish, with a similar dot obliquely before and above it, second formed by a whitish dot ringed with fuscous; a marginal series of small black dots round posterior half of costa and termen: cilia ochreous-whitish. Hindwings in ♂ pale grey, in ♀ grey; cilia whitish-grey.

NATAL, Umkomaas, and ZULULAND, Nkwaleni, in January (Janse); two specimens. Extremely like *compacta*, from which however it may be immediately distinguished by strongly rounded apex of forewings (in *compacta* obtuse and prominent).

Depressaria neoxesta n.sp.

♂ 17-19 mm. Head dark grey, face whitish. Palpi rosy-whitish, second joint sprinkled with blackish, with blackish subapical ring, terminal joint with blackish basal and subapical bands. Thorax pale whitish-ochreous, anterior fourth blackish. Abdomen pale whitish-ochreous sprinkled with grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen obliquely rounded; 2 and 3 stalked; whitish-ochreous, with some scattered fuscous and black scales, costa posteriorly and termen slightly rosy-tinged; a small blackish spot on base of costa; a small spot of faint brownish suffusion near dorsum towards base; a marginal series of blackish dots round

apex and termen: cilia light grey, pale-sprinkled. Hindwings pale grey; cilia whitish-grey, with grey subbasal shade.

ZULULAND, Eshowe, in January; NATAL, New Hanover, in August (Janse); two specimens.

Aulotropha n.g.

Head with appressed scales, sidetufts somewhat raised; ocelli small, posterior; tongue developed. Antennae $\frac{4}{5}$, in ♂ serrulate, shortly and unevenly ciliated, basal joint moderate, with pecten. Labial palpi rather long, curved, ascending, second joint thickened with appressed scales, slightly rough beneath, terminal joint shorter than second, moderate, pointed. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with hairs above. Forewings with 1*b* furcate, 2 from angle, 7 and 8 stalked, 7 to apex, 11 from middle. Hindwings $\frac{3}{4}$, elongate-ovate, cilia 1; 3 and 4 short-stalked, 5-7 nearly parallel.

This genus is very near the North American *Gerdana*, but as the two genera are at present structurally distinguishable, it seems advisable to keep them separate until further species are discovered.

Aulotropha pentasticta n.sp.

♂ 14-16 mm. Head, palpi, and thorax light ochreous-yellowish. Abdomen pale yellowish. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen very obliquely rounded; ochreous-yellowish; stigmata black, plical nearly beneath first discal, an additional dot between first and second discal (in one specimen obsolete), and one towards tornus somewhat beyond second discal: cilia pale yellowish. Hindwings whitish-yellowish, with grey reflections; cilia pale yellow.

NATAL, New Hanover, in November and December (Hardenberg); two specimens. Larva feeding in a portable case composed of a piece of hollow grass-stem, foodplant not recorded.

Streptothyris n.g.

Head with loosely appressed hairs, sidetufts somewhat raised; ocelli posterior; tongue developed. Antennae hardly over $\frac{1}{2}$, in ♂ shortly ciliated, basal joint elongate, stout, without pecten. Labial palpi moderately long, recurved, second joint much thickened with dense scales, rough towards apex beneath, terminal joint as long as second, stout, scaled, pointed. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with rough hairs above. Forewings with 2 from towards angle, 7 and 8 stalked, 7 to costa, 11 from before middle. Hindwings nearly 1, elongate-ovate, cilia $\frac{3}{4}$; a hyaline space beneath cell towards base, limited by a bar from cell to 1*c*, 3 and 4 connate, 5-7 nearly parallel.

Allied to *Cyphothyris*.

Streptothyris tanyacta n.sp.

♂ 27 mm. Head pale whitish-ochreous, collar brown. Palpi ochreous-whitish, second joint with basal third dark fuscous and a faint fuscous supra-median ring, terminal joint with a fuscous supra-median ring. Thorax dark fuscous, posteriorly sprinkled with whitish, anterior margin brown. Abdomen dark grey, apex whitish. Forewings elongate, narrow, costa slightly arched, apex obtuse, termen rounded, oblique; fuscous, irregularly mixed with brown and whitish, and partially with black along veins in disc; first discal stigma

indicated by an indistinct small roundish dark spot outlined with whitish, second by an indistinct transverse dark mark laterally edged with whitish; between these a similarly indistinct small dark oval spot edged with whitish; a terminal series of brown dots edged anteriorly with whitish, and round apex separated with blackish: cilia grey mixed with whitish and blackish (imperfect). Hindwings rather dark grey; cilia grey-whitish, with light grey subbasal shade.

NATAL, Durban, in August (Platt); one specimen, bred but without particulars recorded.

Ceranthes n.g.

Head with appressed scales, sidetufts slightly raised; ocelli small, posterior; tongue short. Antennae $\frac{5}{8}$, in ♂ simple, basal joint moderate, thickened with scales, without pecten. Labial palpi rather long, recurved, rather widely diverging, second joint somewhat roughened with scales beneath, terminal joint half second, moderate, pointed. Maxillary palpi rudimentary. Posterior tibiae clothed with hairs above. Forewings with 2 from $\frac{4}{5}$, 3 and 4 approximated from angle, 7 and 8 stalked, 7 to costa, 11 from $\frac{1}{2}$. Hindwings $\frac{3}{8}$, ovate-lanceolate, cilia 1 $\frac{2}{3}$; 3 and 4 connate, 5-7 nearly parallel.

Intermediate between *Erotis* and *Diocosma*.

Ceranthes thiota n.sp.

♂ 13 mm. Head, palpi, thorax, and abdomen ochreous-whitish. Forewings elongate, rather narrow, costa moderately arched, apex pointed, termen very obliquely rounded; ochreous-white, slightly and irregularly speckled with grey, these specks accompanied by a faint yellowish tinge: cilia ochreous-white. Hindwings pale grey; cilia ochreous-whitish.

ZULULAND, Nkwaleni, in January (Janse); one specimen.

Diocosma eotrocha n.sp.

♀ 13 mm. Head silvery-white. Palpi whitish. Thorax whitish-yellowish, transversely marked with crimson. Abdomen ochreous-whitish, with an interrupted light reddish dorsal stripe. Forewings elongate, widest in middle, costa gently arched, apex obtuse, termen obliquely rounded; pale whitish-yellowish, with scattered crimson scales and irregular crimson markings forming an interrupted reticulation, costal edge white: a crimson line sprinkled with dark fuscous from near base of dorsum to $\frac{2}{5}$ of costa; a crimson ring following this beneath costa, within which is a small pale crimson spot; a large crimson ring beyond middle nearly reaching costa and dorsum, and enclosing a smaller irregular ring, connected with lower part of termen by four crimson lines on veins; a mark of blackish irroration on costa beyond middle; an undefined line of blackish irroration running from $\frac{4}{5}$ of costa to a narrow semioval light crimson spot on middle of dorsum: cilia crimson irrorated with dark grey, towards tornus yellow-whitish. Hindwings and cilia whitish.

NATAL, Stella Bush, in January (Janse); one specimen.

XYLORYCTIDAE

Cladophantis n.g.

Head with loosely appressed hairs; ocelli very small; tongue developed. Antennae $\frac{3}{8}$, in ♂ strongly ciliated, basal joint short, stout, without pecten. Labial palpi long, recurved, second joint reaching base of antennae, thickened with dense appressed scales, terminal joint nearly as long as second, moderate, pointed. Maxillary palpi very short, filiform, appressed to tongue. Anterior

tarsi longer than tibiae, posterior tibiae clothed with rough hairs above. Forewings with 1*b* furcate, 2 from angle, 2-5 closely approximated, 7 to termen, 11 from middle. Hindwings over 1, ovate, cilia $\frac{1}{3}$; 3 and 4 connate, 5 somewhat approximated, 6 and 7 nearly parallel, transverse vein very oblique between 6 and 7, upper branch of parting-vein to between 6 and 7.

Allied to *Stenoma*.

Cladophantis xylophracta n.sp.

♂ 21 mm. Head, palpi, and thorax lilac-fuscous. Abdomen grey-whitish. Forewings suboblong, costa anteriorly moderately, posteriorly hardly arched, apex obtuse, termen slightly rounded, little oblique; lilac-brown, extreme costal edge ochreous; three very indistinct interrupted lines or series of dots of blackish irroration, first about $\frac{1}{3}$, oblique, angled on fold, second from a small round spot beneath middle of costa to a larger spot on dorsum before tornus, third curved, from $\frac{3}{4}$ of costa to praeternal spot; a terminal series of black dots: cilia light fuscous. Hindwings and cilia grey-whitish.

ZULULAND, Eshowe, in January (Janse); one specimen. Distinct and interesting.

Stenoma reticens Meyr.

ZULULAND, Nkwaleni, in January (Janse). This is an Indian species, not previously noticed in South Africa, and possibly attached to some plant of cultivation.

ORNEODIDAE

As explained elsewhere (*Exotic Microlepidoptera*, Vol. 1, p. 555), I now class this family here.

Orneodes tesserata n.sp.

♂ 20 mm. Head ochreous-whitish. Palpi rather long ($2\frac{2}{3}$), ochreous-whitish, second joint obliquely ascending, thickened with dense appressed scales forming a short rough projection beneath at apex, irrorated with dark fuscous on basal half, terminal joint about half second, moderately stout, pointed, erect. Thorax dark grey mixed with blackish. Abdomen ochreous-whitish, mixed with dark fuscous above at base. Forewings whitish; a blackish-grey basal patch, extending on first two segments to $\frac{1}{3}$ of wing, on others to $\frac{1}{3}$, and confluent on fifth segment with a thick blackish-grey transverse streak crossing segments 2-5 before middle of wing; a slightly curved blackish-grey slender fascia crossing segments 2-6 at $\frac{2}{3}$ of wing, portion on third segment rather projecting posteriorly and on fourth anteriorly; four fulvous-ochreous spots on costa from $\frac{1}{3}$ to $\frac{3}{4}$, first small, blackish-sprinkled, second and third larger, both connected with a fulvous-ochreous narrow irregular fascia edged with a few black scales crossing segments 2-6 and narrowly separated from the blackish-grey streak, its portions on segments 3 and 5 projecting posteriorly; an irregular fulvous-ochreous somewhat blackish-sprinkled curved line from fourth costal spot crossing wing, thickest on segments 4 and 5; a rather thick blackish mark on costa before apex, and black praeapical and very minute apical dots on segments 2-6: cilia whitish, somewhat mixed with grey or blackish on markings. Hindwings white; a very small blackish basal patch; transverse series of small fulvous-ochreous blackish-sprinkled spots before middle and at $\frac{3}{4}$, reduced to blackish dots on sixth segment; a series of blackish dots at $\frac{1}{3}$ except on sixth segment, two series between the ochreous

spots, confluent to a single small spot on segments 5 and 6, a series towards apex of segments, and a minute apical dot on each segment; cilia white, slightly mixed with blackish on markings.

TRANSVAAL, Pretoria, in November (Janse); one specimen. A very distinct species, perhaps nearest the Indian *ochrozona*.

Microschismus cymatias n.sp.

♀ 22 mm. Head light grey, crown suffused with white except centrally. Palpi 7, dark grey, apex of terminal joint whitish. Thorax white, shoulders and a median stripe suffused with dark grey. Abdomen grey mixed with white. Forewings light fuscous irrorated with dark fuscous; costa to beyond middle suffused with white, with five small dark fuscous spots, first basal; small cloudy white spots in disc at $\frac{1}{5}$ and towards costa at $\frac{2}{5}$, latter preceded and followed by small dark spots; a faint whitish shade from beneath middle of costa to before middle of dorsum; three distinct waved white lines crossing wing posteriorly, last two terminated on costa by small white rings; a dark fuscous apical dot on each segment, edged anteriorly by a white mark: cilia pale fuscous sprinkled with dark fuscous, barred with white on markings. Hindwings white, faintly infuscated on a shade before middle; narrow grey fasciae at $\frac{2}{3}$ and towards apex of segments; a dark fuscous apical dot on each segment; cilia white, on fasciae grey.

TRANSVAAL, Pretoria, in April (Janse); one specimen.

COPROMORPHIDAE

Sisyroxena syncentra Meyr.

♀ 26 mm. Tongue apparently absent. Labial palpi rather long, porrected, much thickened with dense scales throughout, second joint with rough expanded scales above towards apex, terminal joint short, obtuse. Maxillary palpi imperceptible. Shoulders and thoracic crest mixed with dark fuscous. Forewings with a terminal series of small dark fuscous dots; a very obscure suffused fuscous strigulation extending over wing from $\frac{1}{4}$ to near termen, with some scattered black scales.

TRANSVAAL, Pretoria, in March (Janse); one specimen. Described originally from a male from Madagascar, which had lost its palpi; the above particulars are therefore supplementary to the first description.

HELIOZELIDAE

Antispila argyrozona n.sp.

♀ 5 mm. Head and thorax shining bronze. Palpi extremely short, whitish. Abdomen dark grey. Forewings rather broad-lanceolate; deep purple with indigo-blue and green reflections; a narrow straight transverse silvery-metallic fascia just beyond middle: cilia dark grey, tinged with purple towards base. Hindwings and cilia dark grey.

ZULULAND, Eshowe, in January (Janse); one specimen.

HELIODINIDAE

Eretmocera fuscipennis Zell.

As explained in a note in the *Entomologist's Monthly Magazine*, Vol. LIII, p. 62 (1917), I now conclude that *lunifera* Zell., *derogatella* Walk., *miniata* Wals., *dorsistrigata* Wals., and *Carteri* Wals. are all forms of *fuscipennis*.

The differences are partly sexual and varietal, but partly also the effect of an interesting dimorphism between the carmine and yellow colouring which is worthy of study and perhaps due to slight chemical action, the forms being taken together in equally fresh condition. It ought not to be difficult to find the larva and breed the species freely. Information is also required as to how the imago holds its hind legs in repose.

GLYPHIPTERYGIDAE

Brenthia leucatoroma n.sp.

♀ 7 mm. Head and thorax bronzy-fuscous. Palpi whitish-fuscous, second and terminal joints each with two darker rings. Abdomen dark fuscous. Forewings moderate, posteriorly dilated, costa slightly arched, apex rounded-obtuse, termen somewhat rounded, little oblique; dark fuscous, with bases of scales whitish, forming a very fine transverse striation; an irregular angulated whitish transverse line about $\frac{1}{3}$; indistinct whitish dots on costa beyond middle and at $\frac{2}{3}$, on dorsum at $\frac{2}{3}$ and before tornus, and in disc at $\frac{2}{3}$; a faint transverse-oval whitish ring in disc at $\frac{3}{4}$; a minute silvery dot near costa towards apex; a slender black marginal streak, marked with two round white dots; a group of five or six golden-metallic dots arranged in a double series on lower half of termen, surrounded with dark fuscous: cilia yellow-whitish, towards tornus fuscous (imperfect). Hindwings dark fuscous, bases of scales pale; an oblique-oval whitish ring in middle of disc; a transverse whitish mark towards termen in middle, and a short whitish line from tornus; a violet-metallic mark from costa near apex; an almost marginal violet-metallic line near termen from apex to below middle; cilia fuscous, with oblique whitish patches above and below middle of termen (imperfect).

NATAL, Durban, in August (Janse); one specimen.

Glyphipteryx decachrysa n.sp.

♂ 12 mm. Head and thorax fuscous-bronze, with a fine white line above eyes. Palpi with base white, and three whorls of black white-tipped scales, apex black with white edges. Abdomen dark grey. Forewings elongate, rather narrow, posteriorly somewhat dilated, costa gently arched, apex rounded, termen hardly perceptibly sinuate, oblique; shining bronze, on anterior half infuscated; a white somewhat oblique bar from dorsum before $\frac{1}{3}$, reaching fold; five costal and two dorsal coppery-golden-metallic slender slightly oblique streaks rising from white marginal dots, first costal just before middle, reaching $\frac{1}{3}$ across wing, next two longer, last two shorter, dorsal reaching half across wing, first at $\frac{2}{3}$; a short coppery-golden-metallic streak along tornus, a small discal spot above this (both these partly edged with black), and a short mark on termen beneath a small black apical spot: cilia whitish, suffused with bronze within a dark bronzy-fuscous postmedian shade, indented with white above middle of termen, on tornus with a dark fuscous patch. Hindwings elongate-trapezoidal, blackish-grey; cilia dark grey.

NATAL, Durban, in August (Janse); one specimen.

BLASTOBASIDAE

Blastobasis arguta n.sp.

♂ ♀ 13-14 mm. Head and thorax in ♂ whitish tinged or sprinkled with fuscous, in ♀ fuscous. Palpi dark fuscous, somewhat whitish-sprinkled, apex of second joint white, terminal joint pointed. Antennae in ♂ without notch

moderately ciliated. Abdomen in ♂ whitish-fuscous, anal tuft whitish, in ♀ fuscous. Forewings elongate, narrow, costa slightly arched, apex pointed, termen extremely obliquely rounded; dark fuscous, minutely speckled with white; a direct white fascia before middle, in ♂ rather broad and irregularly suffused anteriorly, in ♀ narrower; apical third of wing suffusedly mixed with whitish, leaving cloudy dark spots of ground colour on tornus and on costa beyond it: cilia grey irrorated with white. Hindwings rather dark grey, paler and thinly scaled towards base, especially in ♂; cilia in ♂ pale grey, in ♀ grey.

NATAL, Umkomaas, in January (Janse); three specimens.

Blastobasis egens n.sp.

♂ ♀ 9-11 mm. Head grey more or less irrorated or suffused with ochreous-whitish. Palpi ochreous-whitish irrorated with dark fuscous, in ♂ rather thick throughout, terminal joint shorter than second, pointed. Antennae in ♂ with basal notch. Thorax grey irrorated with whitish. Abdomen in ♂ whitish-grey, in ♀ grey. Forewings very narrow, pointed, acute; grey irrorated with whitish and dark fuscous; stigmata cloudy, dark fuscous, plical somewhat before first discal, an additional dot beneath costa opposite plical, and one on tornus beneath second discal: cilia light grey speckled with whitish. Hindwings grey; cilia whitish-grey.

NATAL, Sarnia, Umkomaas, Verulam, New Hanover; ZULULAND, Nkwaleni, Eshowe (Janse); in January and February, ten specimens.

SCYTHRIDAE

Scythis nigrispersa n.sp.

♂ 18 mm. Head and thorax pale greyish-ochreous, patagia whitish towards tips. Palpi whitish, second joint light greyish-ochreous except tip, anterior edge of terminal joint grey. Abdomen light ochreous-yellowish. Forewings elongate-lanceolate, apex produced, acute; pale greyish-ochreous, thinly and irregularly sprinkled with black; base and a very undefined streak along fold to beyond middle of wing suffused with whitish; plical and second discal stigma widely remote, blackish; a few whitish scales towards apex: cilia pale greyish-ochreous. Hindwings with 4 and 5 stalked; purplish-grey; cilia light ochreous-yellowish, slightly tinged with grey.

TRANSVAAL, Pretoria, in July (Janse); one specimen.

HYPONOMEUTIDAE

Ethmia glandifera n.sp.

♀ 17 mm. Head white, sidetufts surrounded with blackish, base of collar grey. Palpi white, second joint blackish above, anterior edge of terminal joint black, second and terminal joints with black subapical rings. Thorax white, apex of patagia greyish and a black dot on base, one on each side of back in middle, and two posteriorly. Abdomen light ochreous-yellow. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen slightly rounded, rather oblique; dorsal half grey, limited by a broad white streak from base of costa to costa before apex, enclosed costal space forming a thick dark fuscous streak; a black basal dot in middle; a linear black white-edged dot on lower margin of white streak at $\frac{1}{4}$, a large round black dot within its lower margin in middle, another surrounded with white projecting from

its lower margin beyond $\frac{4}{5}$, and one slightly whitish-edged below middle at $\frac{2}{3}$; a black marginal line round apical part of costa and termen: cilia whitish, grey towards tips and on a subbasal line. Hindwings pale ochreous-yellowish, apical fourth suffused with light grey; cilia pale yellowish, round apex with a pale greyish subbasal line.

TRANSVAAL, Pretoria, in October (Janse); one specimen.

Gymnogramma racemosa n.sp.

♂ ♀ 28–32 mm. Head white. Palpi dark grey, second joint whitish anteriorly. Antennal ciliations of ♂ 1 $\frac{1}{2}$. Thorax white, with a blackish dot on patagia, and two small dark grey spots posteriorly. Abdomen pale greyish. Forewings elongate, costa moderately arched, apex rounded, termen rounded, somewhat oblique; 2 and 3 stalked; white; a small grey spot on base of costa; seven or eight variable small round grey spots in anterior half of disc, and one somewhat larger towards dorsum at $\frac{2}{3}$; a short thick inwardly oblique grey streak from dorsum before tornus, in one specimen nearly obsolete; one or two very variable small grey dots towards apex or termen: cilia white. Hindwings pale grey, anteriorly somewhat whitish-tinged; cilia white, basally more or less tinged with grey.

ZULULAND, Nkandhla Forest, in January (Janse); three specimens.

Hesperarcha n.g.

Head with appressed scales; ocelli small, posterior; tongue short. Antennae $\frac{3}{4}$ (?), in ♂ shortly ciliated, basal joint short, stout, without pecten. Labial palpi short, porrected, with appressed scales, terminal joint short, obtuse. Maxillary palpi rudimentary. Posterior tibiae smooth-scaled. Forewings with 1 *b* furcate, 2 from towards angle, 3 from angle, 6 and 7 closely approximated at base or short-stalked, 7 to apex, 11 from middle. Hindwings 1, elongate-ovate, cilia $\frac{1}{4}$; 3 and 4 connate, 5–7 nearly parallel.

Hesperarcha pericentra n.sp.

♂ 24 mm. Head dark fuscous, with an orange mark on each side behind antennae. Palpi and antennae dark fuscous. Thorax blackish, patagia orange with blackish central spot. Abdomen orange, base of segments rather dark fuscous, basal segment wholly dark fuscous, ventral surface purple-blackish. Forewings elongate, posteriorly rather dilated, costa gently arched, apex rounded-obtuse, termen rounded, oblique; orange; costal edge blackish towards base; a blackish nearly basal dot in middle; a large blackish dot on end of cell; eleven large blackish marginal dots round apex and termen: cilia orange. Hindwings orange; eight blackish marginal dots round apex and termen; cilia orange.

CAPE COLONY (from Albany Museum); one specimen.

COLEOPHORIDAE

Platybathra hysterota n.sp.

♂ ♀ 12–13 mm. Head whitish-ochreous. Palpi whitish-ochreous, terminal joint irrorated with dark fuscous. Thorax light greyish-ochreous. Abdomen ochreous. Forewings very narrowly elongate-lanceolate; greyish-ochreous or light fuscous, more or less sprinkled with brown or dark brown; plical and second discal stigmata dark fuscous, plical beneath middle of wing, second discal at $\frac{3}{4}$: cilia pale fuscous. Hindwings grey; cilia pale fuscous.

NATAL, Umkomaas, in January (Janse); three specimens.

GRACILARIADAE

Phrixosceles melanostola n.sp.

♂ 10 mm. Head white. Palpi white, terminal joint with basal, median, and subapical dark grey dots. Thorax white, with a few dark fuscous specks, patagia speckled with brownish. Abdomen whitish, two basal segments laterally suffused with blackish irroration. Forewings very narrowly elongate-lanceolate; pale ochreous irrorated with fuscous, with an irregular very undefined median longitudinal streak of suffused dark fuscous irroration mixed with white; costal area irregularly marbled with white; dorsal edge irregularly white, emitting slender oblique strigae from middle and before tornus; apex very finely striated transversely with blackish: cilia whitish-grey, round apex with a blackish line. Hindwings whitish-grey, closely strewn throughout with black hairscales; cilia pale grey. Forewings beneath except towards apex, and hindwings wholly clothed with black hairscales.

ZULULAND, Eshowe, in January (Janse); one specimen. The black hairscales may not improbably be characteristic of the ♂ only.

Acrocercops pyramidota n.sp.

♀ 8 mm. Head and thorax white. Abdomen light grey. Forewings very narrow, long-pointed, acute; brownish-ochreous; two large triangular shining white blotches, edged with black scales, on dorsum towards base and beyond middle, their apices just reaching costa, first with a thick irregular projection on dorsum to base; a flattened-triangular white blotch along termen, reaching about half across wing, with an oblique white blackish-edged strigula from costa running into it; a white apical dot: cilia white (imperfect). Hindwings grey; cilia light grey.

TRANSVAAL, Pretoria, in November (Janse); one specimen. The palpi are missing, but the species is easily recognised.

Acrocercops aphrocyma n.sp.

♀ 9 mm. Head ochreous-white. Palpi white, second joint rough-scaled anteriorly towards apex, with two dark fuscous bands, terminal joint with two dark fuscous rings. Thorax white, anterior margin marked with dark fuscous. Abdomen grey-whitish. Forewings very narrow, moderately pointed, acute; whity-brownish; costal half suffused with blackish irroration, transversely mottled with white from base to middle, crossed by a very oblique irregular white streak from before middle of costa to $\frac{2}{3}$ of disc, and beyond this by three or four slender more or less confluent oblique white streaks; dorsal area from base to beyond tornus marked with irregular oblique more or less confluent white streaks not reaching middle of wing, separated by a few blackish scales; a somewhat oblique slightly curved fine pale violet transverse line towards apex, white towards extremities; an elongate black apical dot edged above with white: cilia light grey, round apex with two blackish lines separated with white and two oblique projecting blackish apical hooks. Hindwings grey; cilia light grey.

ZULULAND, Eshowe, in January (Janse); one specimen.

Parectopa praestriata n.sp.

♂ 9 mm. Head, palpi, and thorax grey. Abdomen pale grey. Forewings very narrow, moderately pointed, apex produced, acute; dark grey, mixed

with lighter towards costa and dorsum; two fine oblique whitish strigulae from disc at $\frac{3}{4}$ to termen above tornus, two others little oblique crossing wing beyond these, followed by a small whitish terminal spot, then a fine transverse strigula, and finally a black white-circled apical dot: cilia light grey, beneath apex with an ochreous-yellow basal area. Hindwings grey; cilia light grey.

NATAL, Umkomaas, in January (Janse); one specimen. Allied to the Indian *capnias*.

Gracilaria corrugata n.sp.

♀ 11-12 mm. Head whitish-ochreous sprinkled with grey. Palpi ochreous-whitish minutely ribbed with dark fuscous, with blackish subapical rings of second and terminal joints. Thorax whitish-ochreous irrorated with grey. Abdomen light grey. Forewings very narrow, parallel-sided, rather short-pointed; dark grey finely speckled with whitish, strewn with very small indistinct blackish dots or strigulae, tending to be arranged in longitudinal series: cilia light greyish, round apex and upper part of termen irrorated with dark fuscous. Hindwings grey; cilia light grey.

TRANSVAAL, Pretoria, in February (Janse); two specimens.

Gracilaria vibrans n.sp.

♀ 10 mm. Head fuscous, face suffused with pale greyish-ochreous. Palpi light greyish-ochreous. Thorax violet-fuscous, with a pale dorsal line. Abdomen dark grey. Forewings very narrow, short-pointed; dark purple-fuscous, towards dorsum and median area of costa irregularly mottled with light brownish-ochreous: cilia grey, round apex dark fuscous irrorated with pale ochreous. Hindwings and cilia dark grey.

NATAL, Durban, in December (Janse); one specimen.

Gracilaria semnophanes n.sp.

♀ 17 mm. Head pale ochreous-yellow. Palpi smooth-scaled, ferruginous-brownish. Thorax ferruginous-brownish mixed with pale yellowish. Forewings very narrow, moderately pointed; purple, very indistinctly mottled with pale ochreous-yellowish; a dark brown blotch suffused with deep purple occupying costal half on basal fourth, its edge slightly oblique, followed by an irregular undefined light ochreous-yellowish suffusion extending along costa to $\frac{3}{4}$, costal edge with a few very minute blackish dots: cilia whitish-yellowish, on upper part of termen with three or four lines of blackish specks. Hindwings grey; cilia whitish-grey, with a faint purple tinge.

NATAL, Drummond, in December (Janse); one specimen.

LYONETIADAE

Leucoptera autograptia n.sp.

♂ 5 mm. Head, eyecaps, and thorax shining white, head smooth. Antennae dark grey. Abdomen whitish. Forewings lanceolate, apex produced; 10 absent; shining white; two slightly curved rather strongly oblique fine dark fuscous lines from costa, first at middle, reaching half across wing, second moderately remote, shorter, space between these pale clear yellow except towards costa; a small silvery post-tornal spot edged laterally with dark fuscous strigae and above by an elongate pale yellow spot terminated by a black apical dot: cilia white, three equidistant fine dark fuscous bars in costal cilia between post-

median markings and apex, first oblique, second little oblique, third somewhat inwards-oblique, a projecting dark fuscous bar from apex, and another abruptly directed downwards. Hindwings and cilia whitish.

NATAL, Durban, in December (Janse); two specimens. Closely similar to the European *spartifoliella* group, and also to the Australian *hemizona*.

Leucoptera obelacma n.sp.

♂ ♀ 5-6 mm. Head, eyecaps, and thorax shining white, head smooth. Antennae dark grey. Abdomen whitish. Forewings rather broad-lanceolate, apex produced; shining white; a short fine very oblique ochreous-yellow streak from middle of costa, edged on each side with a fine blackish line; a raised pale golden-metallic post-tornal spot, edged on each side above by a minute black dot, sometimes preceded above also by an ochreous-yellow spot; a second streak from costa at $\frac{2}{3}$ similar to the first but sometimes less defined, its apex connected with a fine longitudinal orange line running into apex, infuscated anteriorly: cilia white, on costa with fine dark fuscous basal and median lines projecting at apex. Hindwings and cilia whitish.

TRANSVAAL, Pretoria, from September to November (Janse); six specimens.

Crobylophora daricella Meyr.

I now consider *staterias* and *onychotis* to be only forms of this species, which varies (perhaps climatically) in development of colour, and has probably been distributed artificially over its wide range with its foodplant, the garden *Plumbago capensis*; presumably South Africa is its native home.

Crobylophora xanthochyta n.sp.

♂ 6 mm. Head, eyecaps, and thorax shining white. Abdomen grey. Forewings lanceolate, apex produced, acute; shining white; a very oblique ochreous-yellow blackish-edged streak from middle of costa, converging to apex of an ochreous-yellow anteriorly blackish-edged triangular spot on costa at $\frac{2}{3}$, both almost confluent with an ochreous-yellow patch surrounding a raised silvery-lead-metallic post-tornal spot edged on each side above by a black dot, this yellow patch extending to apex and into costal cilia: cilia otherwise whitish-grey, with two erect blackish lines above apex, one projecting at apex, and one abruptly downwards-oblique. Hindwings grey; cilia light grey.

TRANSVAAL, Pretoria, in July and October (Janse); two specimens.

Opostega melitardis n.sp.

♀ 7 mm. Head, palpi, antennae, and thorax white. Abdomen ochreous-whitish. Forewings lanceolate; shining white; an oblique yellow-brownish streak from middle of dorsum reaching half across wing; a straight yellow-brownish line from $\frac{2}{3}$ of costa to a small black apical dot: cilia ochreous-whitish, on costa with a subbasal brownish line converging to apical dot. Hindwings and cilia ochreous-whitish.

NATAL, Umkomaas, in January (Janse); one specimen.

Opostega tincta n.sp.

♂ ♀ 7-8 mm. Head, eyecaps, and thorax white. Antennae light greyish-ochreous. Palpi grey. Abdomen grey. Forewings rather broad-lanceolate, apex somewhat produced, acute; shining white; a blackish dot on costa before $\frac{1}{3}$, and a slight dark grey subdorsal mark opposite to it; a rather large

triangular blackish spot on costa at $\frac{2}{3}$, and in ♂ a small blackish mark from tornus opposite, connected with it by a faint ochreous line (in ♀ not indicated); a minute black apical dot: cilia whitish, on costa white with dark fuscous antemedian line obliquely projecting at apex and very fine indistinct fuscous basal line towards origin of cilia. Hindwings grey; cilia grey-whitish, with faint rosy tinge.

NATAL, Umkomaas, in January (Janse); two specimens.

Opostega idiocoma n.sp.

♀ 5-6 mm. Head, palpi, eyecaps, and thorax white, frontal tuft varying from yellow-ochreous to dark fuscous. Abdomen whitish-ochreous to grey. Forewings lanceolate, apex produced, acute; shining white; an oblique wedge-shaped or triangular blackish spot on middle of costa; sometimes a small blackish dot on dorsum anterior to this; a rather oblique slender brownish line before apex, extended into costal cilia; a minute black apical dot: cilia whitish. Hindwings varying from grey to grey-whitish; cilia whitish.

NATAL, Umkomaas, in January (Janse); four specimens.

Bucculatrix praecipua n.sp.

♂ 7 mm. Head and thorax white. Abdomen whitish. Forewings lanceolate, apex produced, acute; white; markings pale ochreous, finely speckled with fuscous; a faint dot on fold at $\frac{1}{4}$; an oblique streak from costa before middle, not reaching half across wing; a spot on dorsum before tornus; an oblique streak from costa beyond middle to termen above tornus, its posterior edge marked with a small black dot below middle; a spot crossing wing before apex, and a dot at apex: cilia whitish, with a few black specks. Hindwings and cilia whitish.

ZULULAND, Eshowe, in January (Janse); one specimen.

Oxymachaeris Wals.

Head wholly rough-haired; ocelli small, inferior; tongue rudimentary. Antennae $\frac{5}{6}$, basal joint moderate, dilated and rough-scaled above. Labial palpi moderate, slender, porrected, second joint with an apical external bristle, terminal joint slightly longer than second, pointed. Maxillary palpi moderate, filiform, folded. Posterior tibiae clothed with fine hairs. Forewings with apex somewhat upturned; 1*b* simple, cell only reaching middle of wing, 2 and 3 stalked, 4 absent, 5 and 6 long-stalked, 7 absent, 9 absent, 8 and 10 long, 11 absent. Hindwings $\frac{2}{3}$, lanceolate, acute, cilia 2; 2 and 3 stalked, 4 absent, cell open between 3 and 5, 5 and 6 stalked, 6 to termen, 7 approximated to stalk of 5 and 6 at base.

There can be no question that the following insect is at least congeneric with *Oxymachaeris niveocervina* Wals., but the highly remarkable neuration differs very considerably, if Lord Walsingham's description and figure are correct; in regard to this it may be supposed that the peculiar (quite abnormal) breadth indicated in both wings in the figure of neuration is erroneous, since the proportions in the coloured figure are widely different; probably the neuration described and figured is also unreliable. I have therefore here given the generic characters of the following species in full; they are very curious, but seem to show that the genus is a highly specialised form of the Erechtliad group of the *Lyonetiadae*.

Oxymachaeris euryzancla n.sp.

♂ 9 mm. Head and thorax white. Abdomen whitish-grey. Forewings elongate-lanceolate; orange-yellow, posteriorly suffused with fuscous; markings snow-white; a wedgeshaped streak rising from basal portion of dorsum and running to disc at $\frac{2}{3}$; a broad upcurved fasciate patch rising from middle of dorsum and running to $\frac{4}{5}$ of disc; a wedgeshaped spot extending along apical fifth of costa, widest posteriorly: cilia white, at apex with a projecting black dash. Hindwings pale grey; cilia grey-whitish.

NATAL, Umkomaas, in January (Janse); one specimen. In *niveocervina* the median white marking should form a complete fascia.

Decadarchis minuscula Wals.

NATAL, Durban, in July (Janse). Not previously recorded from South Africa, but it has a very wide range; the larva feeds in dry vegetable refuse.

NEPTICULIDAE

Nepticula crypsixantha n.sp.

♂ ♀ 6-7 mm. Head blackish. Eyecaps and thorax whitish. Abdomen grey. Forewings lanceolate; whitish-fuscous, coarsely and densely irrorated with dark fuscous: cilia grey-whitish, basal half irrorated with dark fuscous. Hindwings grey or pale grey; in ♂ with short broad expansible tuft of ochreous-yellow hairs covering basal third; cilia whitish-grey.

TRANSVAAL, Pretoria, in September and October (Janse); five specimens.

TINEIDAE

Crypsithyris spissa n.sp.

♂ 11 mm. Head yellow-ochreous, face paler. Palpi pale ochreous. Thorax pale brownish-ochreous. Abdomen greyish-ochreous. Forewings elongate, rather narrow, costa gently arched, apex obtuse-pointed, termen extremely obliquely rounded; 3-5 nearly approximated, 8 absent, 7 and 9 stalked; light ochreous, coarsely and irregularly irrorated with rather dark fuscous, especially posteriorly; plical and second discal stigmata approximated, represented by round cloudy rather dark fuscous spots: cilia pale ochreous-grey, with subbasal line of rather dark fuscous scales. Hindwings with 2-7 separate; rather dark grey; cilia light ochreous-grey.

TRANSVAAL, Pretoria, in December (Janse); one specimen.

Monopis lamprostola n.sp.

♀ 18 mm. Head ochreous-yellow. Palpi yellowish, externally suffused with dark fuscous except apex. Thorax dark fuscous, suffused with orange in middle of anterior margin, posterior crest orange. Abdomen light orange. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen rounded, rather strongly oblique; 7 and 8 stalked; dark fuscous, irregularly strewn with dark purplish raised scales; a large whitish-yellow triangular blotch extending on costa from $\frac{1}{3}$ to $\frac{2}{3}$, and reaching half across wing, costal edge tinged with orange, especially posteriorly: cilia brownish mixed with dark fuscous. Hindwings and cilia orange-yellowish.

TRANSVAAL, Pretoria, in March (Janse); one specimen.

Tineola phaeocephala n.sp.

♂ 11-12 mm. Head rather dark brown. Palpi grey, tip whitish. Antennae whitish, base infuscated. Thorax whitish-ochreous, anterior margin tinged with dark grey. Abdomen pale greyish. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; 7 and 8 stalked; shining pale ochreous, with scattered grey scales, especially posteriorly; costa more or less grey towards base: cilia whitish-ochreous. Hindwings pale grey; cilia ochreous-whitish.

ZULULAND, Eshowe, in January (Janse); two specimens.

Tinea asperata n.sp.

♀ 16-17 mm. Head white, face dark fuscous. Palpi blackish. Thorax white somewhat sprinkled with light grey. Abdomen grey. Forewings elongate, rather narrow, costa slightly arched, apex obtuse-pointed, termen very obliquely rounded; white, somewhat sprinkled with fuscous; costal edge blackish anteriorly, and marked with small blackish raised strigulae; discal stigmata raised, black, remote, second large, transverse; apical fourth of wing irrorated with dark grey, and strewn with blackish raised strigulae, especially on margins: cilia ochreous-whitish, irrorated with dark grey. Hindwings with 5 and 6 stalked; grey, paler towards base; cilia ochreous-whitish, with greyish subbasal shade.

NATAL, Umkomaas, in January (Janse); two specimens.

Tinea zygodes n.sp.

♂ 8 mm. Head white. Thorax white, shoulders dark fuscous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen very obliquely rounded; whitish suffused with light ochreous-yellowish; a thick black streak along costa from base to near middle, apex truncate, lower margin bisinuate; a small black spot on dorsum beyond middle, and some black specks on dorsal edge preceding this; a spot of blackish irroration on costa at $\frac{3}{4}$, and a dot on tornus; a black mark on apical part of costa terminating in apex: cilia ochreous-whitish. Hindwings pointed, grey; cilia pale grey.

NATAL, Sarnia, in August (Janse); one specimen.

Tinea euplocamis n.sp.

♂ 12 mm. Head light clear yellow. Palpi grey. Antennae whitish. Thorax purplish-bronzy-grey. Abdomen light greyish. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; bronzy-grey, with a faint violet tinge: cilia grey. Hindwings light grey, with a faint brassy tinge; cilia pale violet-grey.

NATAL, Umkomaas and Maritzburg, in January and February (Janse); two specimens.

Talaeporia mesochlora n.sp.

♂ 14 mm. Head whitish-ochreous. Palpi grey. Antennal ciliations 1. Thorax whitish-ochreous, patagia and anterior margin grey. Abdomen grey. Forewings elongate, rather narrow, posteriorly somewhat dilated, costa slightly arched, apex obtuse, termen very obliquely rounded; 7 and 8 separate; greyish-fuscous, obscurely and suffusedly marbled with whitish-grey-ochreous except towards costa: cilia grey, base pale. Hindwings light grey; cilia pale ochreous-greyish.

NATAL, Maritzburg, in August; one specimen, bred from a grey silken tapering case of triangular section, 13 mm. long \times 1.5 mm. broad; probably feeds on lichens.

Fumea ominosa n.sp.

♂ 11 mm. Head, palpi, thorax, and abdomen dark fuscous, palpi apparently rudimentary. Antennal pectinations 7. Forewings elongate, costa moderately arched, apex obtuse, termen obliquely rounded; dark fuscous, faintly purplish-tinged; cilia concolorous. Hindwings and cilia dark fuscous.

TRANSVAAL, Pretoria, in November (Janse); one specimen.

Sapheneutis diplopsamma n.sp.

♂ 14 mm. Head pale yellow-ochreous. Palpi short, whitish-ochreous. Antennal ciliations $1\frac{1}{2}$. Thorax whitish-ochreous sprinkled with brownish. Abdomen whitish-ochreous. Forewings elongate, costa gently arched, apex obtuse, termen obliquely rounded; light ochreous suffusedly irrorated with rather dark brownish: cilia light brownish. Hindwings and cilia whitish-ochreous.

NATAL, New Hanover, in September (Hardenberg); one specimen.

Sapheneutis certificata n.sp.

♂ 15 mm. Head whitish-ochreous. Palpi dark fuscous. Antennal ciliations $1\frac{1}{2}$. Thorax whitish, with a blackish blotch occupying anterior half of dorsum and shoulders. Abdomen grey. Forewings elongate, costa gently arched, apex obtuse, termen obliquely rounded; 8 absent; grey-whitish, with some scattered strigulae of grey and dark fuscous scales; an elongate black spot along basal fifth of costa; four small blackish spots on costa from $\frac{2}{5}$ to $\frac{3}{5}$, first three connected by grey suffusion; small blackish spots representing discal stigmata, remote, a small blackish irregular spot towards dorsum somewhat before first: cilia grey-whitish. Hindwings grey; cilia light grey, with darker basal shade.

ZULULAND, Nkwaleni, in January (Janse); one specimen.

Melasina salicoma n.sp.

♂ 20 mm. Head grey-whitish. Palpi slender, hairy, grey. Antennal pectinations 4. Thorax and abdomen fuscous. Forewings elongate, rather dilated posteriorly, costa gently arched, apex rounded-obtuse, termen rounded, somewhat oblique; fuscous-grey, coarsely and suffusedly strigulated with dark fuscous; the confluence of strigulation forms a cloudy blotch in middle of disc and a transverse mark on end of cell: cilia fuscous, basal half obscurely barred with darker. Hindwings rather dark grey; cilia fuscous, with indistinct darker subbasal line.

CAPE COLONY, Grahamstown, in September (Mally); one specimen, bred. The larval case (sent) is slenderly elongate-conical (length 24 mm., breadth at orifice 2.5 mm.), covered with a smooth scale-work apparently consisting of small flat fragments of bark, orifice rather oblique; pupa protruded in emergence from a slit at about $\frac{2}{3}$ length from orifice.

Eucryptogona secularis n.sp.

♂ 28 mm. Head white, face ochreous-tinged. Palpi 4, fuscous, white above and internally. Antennal ciliations $\frac{1}{2}$. Thorax whitly-brownish. Abdomen fuscous-whitish. Forewings elongate, rather narrow, posteriorly

slightly dilated, costa gently arched, apex obtuse-pointed, termen slightly rounded, rather strongly oblique; light brownish, with some irregular dark brownish sprinkling; an irregular waved cloudy subterminal shade of dark brown irroration from costa to beneath angle of cell: cilia whitish-brownish, with rows of dark brown points. Hindwings pale grey; cilia grey-whitish.

TRANSVAAL, Johannesburg, in May (Linford); one specimen.

Zesticodes n.g.

Head with dense rough scales; ocelli imperceptible; tongue absent. Antennae $\frac{5}{3}$, in ♂ serrate, ciliated, basal joint moderate, without pecten. Labial palpi moderate, porrected, loosely scaled, pointed. Maxillary palpi obsolete. Thorax with posterior crest. Posterior tibiae densely clothed with very long rough hairs. Forewings with numerous small groups of raised scales; 2 from angle, 7 to apex, 11 from before middle. Hindwings 1, elongate-ovate, cilia $\frac{4}{3}$; 2-7 separate; a hyaline spot beneath cell at base.

Allied to *Hapsifera*.

Zesticodes cyanoscia n.sp.

♂ 20 mm. Head and thorax dark indigo-fuscous. Palpi whitish-ochreous mixed with dark fuscous. Abdomen pale ochreous-yellowish. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen obliquely rounded; whitish-ochreous; a dark fuscous patch suffused with indigo-leadens occupying basal fourth of wing and extending on costal half to middle, thence along costa more suffused and diminishing to apex; ground colour on rest of apical half slightly mixed with grey and blackish; two small blackish spots obliquely placed in disc beyond $\frac{3}{4}$, lower posterior: cilia brownish with bluish reflections, becoming whitish-ochreous beneath tornus, round apex and costa dark indigo-leadens-grey. Hindwings pale ochreous-yellowish, apical half suffused with grey; cilia pale yellowish, round apex with two dark grey lines.

NATAL, Umkomaas, in January (Janse); one specimen.

Sclerophricta n.g.

Head rough-haired; ocelli very small, posterior; tongue absent (?). Antennae $\frac{3}{3}$, in ♂ biciliated with long fascicles, basal joint short, with pecten. Labial palpi moderate, curved, subascending, second joint clothed beneath and externally with very long rough spreading hairs, terminal joint short, slender, hardly pointed. Maxillary palpi obsolete (?). Posterior tibiae clothed with rough scales. Forewings somewhat rough-scaled, towards base with some erect hairscales; 1b furcate, 2 from towards angle, 7 to costa, 8 absent, 11 from middle. Hindwings under 1, elongate-ovate, cilia 1; 4 absent, 5-7 nearly parallel.

Sclerophricta tyreuta n.sp.

♂ 11 mm. Head and palpi light ochreous somewhat mixed with fuscous. Thorax fuscous mixed with ochreous (defaced). Abdomen dark fuscous, anal tuft light ochreous. Forewings elongate, costa gently arched, apex obtuse, termen very obliquely rounded; light ochreous tinged with grey, coarsely and irregularly striated and strigulated transversely with blackish; four moderate undefined fuscous fasciae, first basal, second antemedian, third postmedian, somewhat oblique, fourth praeapical: cilia pale ochreous, partially suffused with brownish and mixed with dark fuscous. Hindwings blackish; cilia grey mixed with dark fuscous.

TRANSVAAL, Pretoria, in February (Munro); one specimen.

Scardia polystacta n.sp.

♀ 12-16 mm. Head ochreous-whitish suffusedly spotted with dark fuscous. Palpi dark fuscous somewhat mixed with whitish, terminal joint whitish with base and median band blackish. Thorax blackish with suffused transverse pale ochreous band. Abdomen dark fuscous. Forewings elongate, narrow, costa gently arched, apex obtuse, termen rounded, rather strongly oblique; all veins separate, 7 to apex; brown; costa narrowly black, on basal half dotted with white, on apical half with four or five small ochreous-white spots; a blackish band occupying dorsal third from base to tornus, basally reaching costa, irregularly dotted with white, more strongly on dorsum; an irregular elongate blackish patch dotted with white extending through disc from near base to near termen, interrupted at $\frac{2}{3}$; terminal edge black dotted with white: cilia ochreous-whitish with a blackish basal line, with broad blackish bars towards tornus and on costa, and a narrow one beneath apex. Hindwings dark purple-grey; cilia grey.

NATAL, New Hanover (Hardenberg), and ZULULAND, Isputeni (Janse), in January and March; two specimens.

ADELIDAE

Ceromitia benedicta n.sp.

♂ 15 mm. Head yellow-ochreous. Palpi very short, loosely scaled, grey-whitish. Thorax pale ochreous. Forewings elongate, rather narrow, costa anteriorly slightly, posteriorly moderately arched, apex obtuse, termen very obliquely rounded; all veins separate; pale greyish-ochreous; costal edge dark grey towards base: cilia pale ochreous. Hindwings with 5 and 6 approximated at base; grey; cilia whitish-grey.

TRANSVAAL, Pretoria, in December (Janse); one specimen.

Ceromitia resonans n.sp.

♂ 15 mm. Head grey, crown whitish posteriorly. Palpi rather short, whitish-grey. Thorax whitish-grey. Abdomen light grey, anal tuft ochreous-whitish. Forewings elongate, rather narrow, costa anteriorly slightly, posteriorly moderately arched, apex obtuse, termen very obliquely rounded; 8 and 9 stalked; grey strigulated with dark fuscous: cilia pale grey. Hindwings with 5 and 6 approximated at base; bronzy-grey; cilia pale grey.

ZULULAND, Eshowe, in January (Janse); one specimen.

Bela Vista is situated in Port. East Africa

SOUTH AFRICAN MICRO-LEPIDOPTERA

SUPPLEMENT

The additional species that follow were received subsequently through the kindness of Mr C. J. Swierstra, and the typical specimens are in the Transvaal Museum.

EUCOSMIDAE

Eucosma thematica n.sp.

♀ 12 mm. Head white sprinkled with grey, crown towards sides suffused with grey. Palpi dark grey, terminal joint and apex of second white. Thorax blackish-grey irregularly irrorated with whitish. Abdomen dark grey. Forewings elongate, rather narrow, costa slightly arched, apex obtuse, termen slightly sinuate, rather oblique; dark grey, posteriorly irrorated with white; basal patch occupying $\frac{1}{3}$ of wing, suffusedly striated with dark fuscous, with a dorsal spot of whitish irroration at its middle, posterior edge obtusely angulated rather below middle, followed by a suffused whitish fascia; an undefined darker narrow rather oblique obtusely angulated central fascia, its costal portion formed by a fine blackish streak; ocellus limited by two thick leaden streaks, and containing two or three irregular dark fuscous dots; costa posteriorly with pairs of whitish strigulae separated by blackish-fuscous marks; a slender incurved blackish streak from costa before apex to middle of termen, with a projection beneath apex: cilia grey irrorated with white and dark fuscous. Hindwings with 3 and 4 stalked; rather dark grey; cilia grey sprinkled with whitish points.

TRANSVAAL, Pretoria, in January (Swierstra); one specimen.

Eucosma opsonoma n.sp.

♂ 13 mm. Head and thorax ferruginous, face paler. Palpi whitish, second joint suffused with ochreous-grey. Abdomen light grey, base whitish. Forewings elongate, costa gently arched, without fold, apex obtuse, termen slightly rounded, rather oblique; light grey, irrorated with whitish; basal patch mostly suffused with ferruginous except towards costa, outer edge oblique, slightly convex; dorsal space between this and central fascia suffused with whitish; three or four dark grey dots on anterior half of costa; central fascia indicated by a short fine oblique ferruginous streak from middle of costa and some ferruginous irroration elsewhere, posterior edge obtusely angulated in middle; three small oblique ferruginous spots on costa between this and apex, with faint ferruginous oblique strigae rising from them; a ferruginous apical spot; ocellus enclosed by approximated rather thick silvery-grey-whitish streaks, and containing three small indistinct dark greyish-ferruginous dots: cilia light grey mixed with ferruginous, beneath tornus mixed with whitish. Hindwings with 3 and 4 stalked; grey, veins suffused with darker; cilia whitish-grey.

TRANSVAAL, Pretoria, in January (Swierstra); one specimen.

Eucosma thalameuta n.sp.

♂ 16 mm. Head dark grey. Palpi whitish externally sprinkled with grey, apical half blackish. Thorax blackish. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, without fold, apex obtuse, termen slightly sinuate, little oblique; whitish, partially tinged with pale pinkish-ochreous, strewn with small light blue-leaden-grey spots and transverse marks; basal patch occupying $\frac{1}{4}$ of wing, dark leaden-grey marked and edged with black, dorsal portion white with an irregular black spot near base; a thick black streak from middle of costa obliquely outwards to disc, thence curved round to apex, edged beneath by some brownish-ochreous suffusion in disc before $\frac{2}{3}$, and interrupted by a light blue-leaden-grey striga at $\frac{2}{3}$ and again nearly interrupted by two similar marks near apex; a small deep ochreous spot towards dorsum before tornus; three small black spots on posterior half of costa: cilia grey, with whitish tornal patch. Hindwings with 3 and 4 stalked; rather dark grey; cilia grey.

CAPE COLONY, Port St John, in December (Swinney); one specimen.

Eucosma drastica n.sp.

♀ 13 mm. Head, palpi, and thorax fuscous mixed with dark fuscous and whitish. Abdomen rather dark fuscous. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen somewhat sinuate beneath apex, bowed, little oblique; grey, mixed with dark fuscous; dorsal half from base to beyond middle blackish-fuscous, oblique blackish-fuscous streaks from costa at $\frac{1}{3}$ and middle running into this; posterior half of costa blackish-fuscous, with five white strigulae, first originating a very oblique deep blue-leaden striga, others tipped with blue-leaden, subcostal area here tinged with ochreous; a triangular blackish-fuscous praeternal spot, separated from preceding dark area by an irregular leaden-metallic streak; ocellus laterally edged with leaden-metallic streaks, and crossed by several irregular blackish dashes; above this an irregular patch of blackish suffusion extending from dark area to termen; terminal edge irrorated with whitish-ochreous: cilia violet-leaden-grey, towards tornus irrorated with ochreous-whitish, round apex and upper part of termen with black subbasal line. Hindwings with 3 and 4 connate; dark grey, lighter anteriorly; cilia light grey, with darker subbasal shade.

CAPE COLONY, Port St John, in August (Swinney), one specimen; also one in my collection from NATAL, Pinetown, in February (Leigh).

Eucosma lobostola n.sp.

♂ 10-11 mm. Head, palpi, and thorax ochreous-whitish. Abdomen pale grey. Forewings elongate, posteriorly slightly dilated, costa very slightly arched, without fold, apex obtuse-pointed, termen sinuate, somewhat oblique, ochreous-whitish, somewhat strigulated with light brown-reddish, posterior $\frac{2}{3}$ suffused with brown-reddish; a spot of grey suffusion with some raised scales just beneath costa near base; margin of basal patch indicated by brownish or fuscous spots on costa at $\frac{1}{3}$ and dorsum at $\frac{2}{3}$, and a subtriangular blotch in disc before middle; posterior half of costa marked with small dark brown spots and whitish strigulae; two indistinct fine oblique blue-leaden strigae beneath these; ocellus edged laterally with silvery streaks, and including three irregular black dots: cilia reddish-whitish, with red-brown subbasal line, tips towards apex dark fuscous. Hindwings with 3 and 4 coincident; grey; a strong pro-

jecting dorsal lobe folded over beneath and concealing an area clothed with dark fuscous scales; cilia grey-whitish.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); two specimens.

Argyroploce exhilarata n.sp.

♀ 17 mm. Head and palpi ferruginous. Thorax whitish-ochreous tinged with reddish, crest ferruginous. Abdomen pale grey. Forewings elongate, posteriorly rather dilated, costa gently arched, apex obtuse, termen straight, rather oblique; brown-reddish obscurely overlaid with glistening violet iridescence, indistinctly darker-strigulated; markings dark red-brown mixed with black; an interrupted striga indicating edge of basal patch, obtusely angulated in middle; some dots or strigulae on dorsum; upper half of central fascia well-marked, narrow, irregular, oblique, pale-edged anteriorly, with a pale dot in an excavation of its extremity posteriorly; ill-marked spots outlined rising from dorsum in middle and before tornus; a short oblique streak from apex: cilia light brown-reddish. Hindwings grey; cilia grey-whitish, towards base tinged with pale grey-reddish, towards tornus with grey subbasal shade.

TRANSVAAL, Pretoria, in March (Swierstra); one specimen.

Argyroploce sponditis n.sp.

♂ 19 mm. Head and thorax dark brown. Palpi brownish, towards base whitish-ochreous, second joint with two suffused dark grey spots towards apex. Abdomen grey. Forewings elongate, posteriorly dilated, costa gently arched, apex obtuse, termen nearly straight, little oblique; reddish-brown mixed with fuscous and dark fuscous; basal patch darker on upper half, edged by a sinuate rather oblique strigula; central fascia on upper half darker, moderate, oblique, obsolete beneath; an elongate patch of whitish-ochreous suffusion running from posterior edge of this in disc to two pairs of suffused whitish-ochreous strigulae on costa about $\frac{4}{5}$, followed on lower portion by a broad dark streak forming a rounded-acute angle upwards, its anterior arm short, posterior arm running to middle of termen; several small dark marks on posterior half of costa; ocellus laterally margined by very obscure dark leaden-grey streaks: cilia reddish-fuscous obscurely barred with dark fuscous. Hindwings rather dark grey; cilia grey, with darker subbasal shade.

CAPE COLONY, Port St John, in January (Swinney), one specimen; also one in my collection from NATAL, Pinetown, in January (Leigh).

Argyroploce encharacta n.sp.

♂ 16 mm. Head brownish-ochreous, face and sides of crown mixed with reddish-fuscous. Palpi reddish-fuscous, basal area and a spot on second joint ochreous-whitish, tip whitish. Thorax pale ochreous. Abdomen pale greyish, anal tuft whitish-ochreous. Forewings moderately broad, dilated posteriorly, costa moderately arched, apex obtuse, termen almost straight, vertical; pale ochreous; costa strigulated with dark fuscous; some irregularly scattered fine short reddish-fuscous longitudinal lines, a group of several stronger lines partially suffused together indicating lower $\frac{2}{3}$ of central fascia; an oblique triangular patch of similar marking from costa towards apex finely attenuated to termen above tornus, followed by a dark stria and some pale violet iridescence; a fine dark fuscous terminal stria: cilia whitish-ochreous, on upper part of termen with basal half brown-reddish. Hindwings light grey, veins darker; cilia grey-whitish, with grey subbasal shade.

CAPE COLONY, Port St John, in December (Swinney); one specimen.

Hemimene embolaea n.sp.

♀ 11-13 mm. Head and palpi ochreous. Thorax ochreous, with fuscous bars on shoulders and two on posterior half. Abdomen grey. Forewings elongate, costa gently arched, apex obtuse-pointed, termen rather strongly sinuate beneath apex, little oblique; pale ochreous, partially marked and suffused with fulvous and strewn with coarse blackish transverse marks and strigulae; costa marked with ochreous-whitish oblique strigulae between these; a slender oblique dark brown streak from middle of costa, preceded by an irregular indistinct blue-leadен-metallic interrupted line running to dorsum at $\frac{2}{3}$, and followed by a fine blue-leadен-metallic sinuate line running to termen beneath apex, limiting ocellus, which is margined anteriorly by a thick whitish streak and posteriorly by a streak of dark fuscous irroration, and crossed by several fine blackish dashes: cilia pale ochreous tinged with brownish except towards base, suffused with brown round apex towards tips, with dark brownish subbasal dots beneath apex and above tornus. Hindwings grey; cilia ochreous-whitish, with light grey subbasal shade.

TRANSVAAL, Pretoria, in February and March (Swierstra); two specimens. This is the first species of the genus recorded from South Africa.

Laspeyresia violescens n.sp.

♀ 16 mm. Head and thorax light violet-grey, face pale fulvous-ochreous. Palpi whitish-ochreous. Abdomen pale greyish. Forewings elongate-triangular, costa gently arched, apex obtuse, termen sinuate-indented beneath apex, thence somewhat obliquely rounded; violet-grey, anteriorly suffusedly mixed with grey-whitish, posteriorly finely speckled with grey-whitish; costa on posterior $\frac{2}{3}$ grey-whitish strigulated with dark grey; an indistinct suffused darker grey oblique streak from dorsum at $\frac{2}{3}$, reaching more than half across wing, forming anterior limit of a very obscure more whitish-tinged dorsal patch; a dark blue-leadен very oblique striga from costa beyond middle, strongly angulated opposite apex, and becoming obsolete towards dorsum, preceded in disc by several minute black dots or strigulae; a fine very oblique blue-leadен striga before apex; a sinuate series of about six small black elongate dots towards termen: cilia pale violet-grey, with blackish-grey basal line. Hindwings grey, apical edge whitish-suffused; cilia whitish.

TRANSVAAL, Pretoria, in December (Swierstra); one specimen.

GELECHIADAЕ

Telphusa confixa n.sp.

♂ ♀ 11-12 mm. Head and thorax white irrorated with dark fuscous, thorax anteriorly longitudinally marked with blackish. Palpi white, basal half and a subapical band of second joint, and base and two bands of terminal joint blackish. Abdomen greyish. Forewings elongate, narrow, costa slightly arched, apex pointed, termen extremely obliquely rounded; 6 out of 7 near base; dark grey suffusedly irrorated with white, with some black scales; elongate blackish spots on costa near base, before middle, and at $\frac{2}{3}$; a black streak from beneath first of these along fold to near extremity; discal stigmata black connected by a black dash, second followed by a disconnected black dash running nearly to apex; cloudy black marginal dots round posterior part of costa and termen: cilia grey, round apex sprinkled with whitish. Hindwings grey, thinly scaled towards base; cilia light grey.

TRANSVAAL, Pretoria, in February and March (Swierstra); four specimens.

Gelechia exoenota n.sp.

♀ 18 mm. Head pale rosy-ochreous. Palpi pale ochreous, basal joint and base of second dark fuscous, terminal joint anteriorly sprinkled with dark fuscous. Thorax dark violet-fuscous, apex of patagia suffused with red-brown. Abdomen rather dark grey, apex light reddish-ochreous. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen sinuate, very oblique; dark red-brown, suffusedly mixed with dark purplish-fuscous; a short indistinct light reddish-ochreous transverse mark from costa almost at base; plical and second discal stigmata small, indistinct, blackish; a small indistinct spot of ochreous suffusion on costa at $\frac{3}{4}$; cilia coppery-brownish, anteriorly slightly greyish-tinged, posteriorly with three fine grey lines. Hindwings with apex pointed, termen sinuate; rather dark grey; cilia light grey.

TRANSVAAL, Pretoria, in February (Swierstra); one specimen.

Apotactis n.g.

Head with appressed scales, sidetufts somewhat raised; ocelli small, posterior; tongue developed. Antennae $\frac{3}{4}$, in ♂ serrulate, simple, basal joint moderate, without pecten. Labial palpi very long, recurved, second joint with strong dense projecting apical tuft beneath, terminal joint longer than second, somewhat thickened and roughened anteriorly, acute. Maxillary palpi very short, filiform, appressed to tongue. Posterior tibiae clothed with very long fine hairs above. Forewings with 1*b* furcate, 2-5 rather approximated, 6 absent, 7 and 8 stalked, 7 to just above apex, 11 from middle. Hindwings 1, elongate-trapezoidal, apex obtuse, termen scarcely sinuate, cilia 1; 3 and 4 connate, 5 somewhat approximated, 6 and 7 stalked.

Allied to *Chelaria*.

Apotactis drimylota n.sp.

♂ 14-16 mm. Head whitish, sides of crown tinged with grey. Palpi dark grey, apex of second joint whitish, terminal joint whitish with two bands of dark grey irroration. Thorax whitish irrorated with grey, sometimes anteriorly suffused with dark fuscous. Abdomen grey, anal tuft whitish. Forewings elongate, narrow, costa gently arched, apex obtuse, termen very obliquely rounded; grey, variably irrorated with white, with a few black scales; small elongate blackish spots on costa at $\frac{1}{3}$, $\frac{1}{2}$, and middle; black elongate dots beneath costa near base, and on fold at $\frac{1}{4}$, and sometimes a smaller one beyond former of these; stigmata rather large, elongate, black, plical slightly before first discal; two or three short black dashes towards costa posteriorly, and one above tornus; some cloudy blackish dots on posterior part of costa and termen: cilia light grey, round apex sprinkled with darker and whitish. Hindwings grey, slenderly hyaline beneath cell towards base; cilia light grey.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); three specimens.

COSMOPTERYGIDAE

Labdia macrobela n.sp.

♂ 11 mm. Head bronzy-grey, crown with very fine central and lateral white lines. Palpi white lined with dark fuscous. Thorax bronzy-grey, with three very fine white lines, apical half of patagia white. Abdomen pale ochreous. Forewings narrow-lanceolate, apex long-caudate; bronzy-grey; a silvery-white line along costa from base to fascia, and a very oblique line from this near base to beneath costa at $\frac{2}{3}$; a strong white median longitudinal streak

from base to apex; a fine white line beneath this from towards base, running into it at $\frac{2}{3}$; a dull orange postmedian transverse fascia interrupted by median streak, margined on each side above and below this by two silvery-metallic spots, upper anterior one followed by a black dot; costa silvery-white for a short distance beyond fascia: cilia light grey, with white apical bar. Hindwings grey; cilia light grey.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen.

Microcolona pantomima Meyr.

TRANSVAAL, Pretoria, in December (Swierstra); two ♀ examples. The original specimens of this species were from French Congo; the forewings of ♀ are rather broader and less pointed than in ♂, but ♂ examples also vary in these particulars, and the species is so well-marked that its identity cannot be doubted.

OECOPHORIDAE

Epiphractis thysanarcha n.sp.

♀ 20 mm. Head, palpi, and thorax dull brownish-crimson, scales of forehead roughly projecting, face greyish; second joint of palpi expanded above with long rough projecting scales except toward base, terminal joint $\frac{1}{3}$ of second. Abdomen grey. Forewings elongate, moderate, costa moderately arched, apex obtuse-pointed, termen nearly straight, oblique; dull light crimson, slightly ochreous-tinged, with a few scattered blackish scales posteriorly; an inwardly oblique dark grey streak from middle of dorsum, reaching half across wing, edged posteriorly with light ochreous-yellowish; second discal stigma small, dark grey; a short rather inwards-oblique streak of dark grey suffusion from dorsum beneath it: cilia dull light crimson, darker towards tips, and suffused with dark grey on tornus. Hindwings grey; cilia light grey.

TRANSVAAL, Pretoria, in March (Swierstra); one specimen. Distinguished from all others of the genus by the peculiar palpi; otherwise normal in all respects, and certainly not separable generically.

Porthmologa deltophanes n.sp.

♂ 15 mm. Head white, face somewhat marked with fuscous. Palpi dark fuscous, tip white. Thorax ochreous-white, shoulders and a spot on posterior extremity dark fuscous. Abdomen grey, anal tuft whitish. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; fuscous; a white dot on base of dorsum; a triangular ochreous-white antemedian dorsal blotch, anterior edge direct, nearly reaching costa, preceded and followed by strong blackish-brown suffusion; first discal stigma moderate, black, second represented by two transversely placed minute black dots; a broad undefined transverse band of white irroration beyond middle; a small white spot on costa at $\frac{4}{5}$, from which a very fine incurved white line crosses wing, limiting a round fuscous antepical area of which the upper part is mixed with blackish: cilia whitish-grey, base irregularly mixed with dark fuscous, tips suffused with fuscous towards middle of termen, on costa wholly fuscous mixed with dark fuscous except a small white spot on costal spot. Hindwings grey; cilia light grey.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen. Appears to agree in all structural essentials with the genus *Porthmologa*, hitherto represented only by a single Indian species; but superficially very distinct.

Proceleustis zelotypa n.sp.

♂ 13-14 mm. Head pale ochreous tinged with fuscous, face whitish. Palpi white, base of second joint dark fuscous, subapical bands of second and terminal joints fuscous. Antennae uniform light greyish-ochreous. Thorax dark fuscous. Abdomen grey. Forewings elongate, rather narrow, costa gently arched, apex pointed, termen extremely obliquely rounded; rather dark ashy-fuscous; a moderately broad rather irregular-edged whitish-ochreous fascia at $\frac{1}{3}$, edged with irregular black scales, posterior margin angulated below middle; an irregular ochreous-whitish transverse spot from costa at $\frac{2}{3}$, reaching half across wing, second discal stigma irregular, black, projecting into its lower margin; sometimes an ochreous-whitish apical dot: cilia light fuscous, sprinkled with dark fuscous, with an ochreous-whitish spot on costal spot. Hindwings with 3 and 4 stalked (in one wing of one specimen coincident); rather dark grey; cilia light fuscous.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); two specimens.

XYLORYCTIDAE

Odites cuculans n.sp.

♂ ♀ 15-19 mm. Head and thorax whitish-yellowish. Palpi yellow-whitish, second joint brownish-tinged on basal half. Abdomen pale ochreous-yellowish. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen slightly rounded, oblique; whitish-yellowish; costal edge sometimes slightly brownish-tinged anteriorly; a blackish dot towards costa in middle, and one on lower angle of cell: cilia whitish-yellowish. Hindwings and cilia whitish-ochreous.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); three specimens. I have also in my collection a worn specimen apparently of the same species from Ubangi, French Congo.

Odites incolumis n.sp.

♂ 16 mm. Head and thorax white. Palpi white, second joint infuscated except towards apex. Abdomen pale grey. Forewings elongate, rather narrow, costa gently arched, apex obtuse, termen rounded, rather strongly oblique; white; a black dot towards costa near base; stigmata black, plical obliquely beyond first discal, almost equally near second; a curved subterminal series of several minute groups of black scales in disc; an almost marginal series of small black dots round posterior part of costa and termen: cilia white. Hindwings pale grey; cilia whitish.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen.

Odites nubeculosa n.sp.

♀ 26 mm. Head whitish. Palpi whitish, second joint somewhat infuscated except apex. Thorax whitish-fuscous. Abdomen whitish. Forewings elongate, costa gently arched, apex obtuse, termen nearly straight, little oblique, rounded beneath; fuscous-whitish, with irregularly scattered dark fuscous specks except towards costa; discal stigmata black, a cloudy fuscous spot beneath and slightly beyond second; cloudy dots of suffused dark fuscous scales along termen: cilia whitish. Hindwings and cilia whitish.

NATAL, Durban (Leigh); one specimen.

ORNEODIDAE

Orneodes photaula n.sp.

♂ 14-15 mm. Head and thorax pale greyish-ochreous mixed with grey, lower part of face whitish. Palpi 3, grey, second joint long, porrected, above with rough projecting white hairscales, terminal joint short, slender, white, with dark grey median band. Abdomen ochreous-whitish irrorated with dark grey, segmental margins white. Forewings pale greyish-ochreous closely irrorated with dark grey; a yellow-ochreous streak along segment 1 from about $\frac{1}{3}$, with marginal indications of four undeveloped grey bars, and terminated by a dark grey white-margined subterminal bar; on segments 2-6 somewhat darker curved bands at middle and $\frac{3}{4}$, edged with white marks, second band on segment 2 narrow and near apex; tips of all segments white preceded by black dots: cilia grey, on margins of bands with oblique white marks. Hindwings with all segments similar to segments 3-6 of forewings.

TRANSVAAL, Pretoria, in February (Swierstra); one specimen. Also one in my collection from Johannesburg in January. Recognisable by yellowish streak of first segment of forewings.

GLYPHIPTERYGIDAE

Simaethis gratiosa Meyr.

TRANSVAAL, Pretoria, in January; CAPE COLONY, Port St John, in October (Swierstra); two specimens, differing from one another and from the original examples (described from the Seychelles) in the development and extent of the fulvous suffusion of forewings, but otherwise apparently similar (neither is in good condition) and justly referable to the same species.

BLASTOBASIDAE

Blastobasis extensa n.sp.

♀ 17-18 mm. Head, palpi, and thorax dark fuscous closely and suffusedly irrorated with white. Abdomen grey-whitish. Forewings elongate, narrow, costa hardly arched, rather bent towards $\frac{2}{3}$, apex pointed, termen extremely obliquely rounded; dark ashy-fuscous sprinkled with whitish, broadly streaked with whitish suffusion along margins of cell, vein 1 b, and in disc posteriorly, veins posteriorly obscurely lined with whitish; second discal stigma represented by an obscure spot of dark fuscous ground colour placed in this suffusion: cilia light grey, base with some dark fuscous scales. Hindwings grey; cilia light grey.

TRANSVAAL, Pretoria, in December and February (Swierstra); two specimens.

ELACHISTIDAE

Symphoristis n.g.

Head smooth; ocelli small, posterior; tongue developed. Antennae $\frac{3}{4}$, in ♂ ciliated, basal joint rather flattened and dilated with scales, with strong pecten. Labial palpi moderately long, slender, curved, ascending, terminal joint shorter than second, acute. Maxillary palpi very short, drooping, filiform. Posterior tibiae clothed with very long fine hairs above. Forewings with 2 from angle, 4 absent, 7 and 8 stalked, 7 to costa, 11 from middle. Hindwings $\frac{3}{8}$, lanceolate, cilia 2; 2-4 remote, 5 absent, 6 and 7 stalked.

Type *ptychospila*; also *nimbifera* Meyr. is referable here. The genus (which I had not hitherto thought it necessary to separate) differs from *Elachista* by the separation of vein 6 of forewings.

Symphoristis prychoaspila n.sp.

♂ ♀ 9-10 mm. Head white. Palpi and thorax white with a few dark fuscous specks. Abdomen light grey. Forewings elongate-lanceolate; pale grey more or less mixed with white and irregularly sprinkled with dark fuscous; area of fold broadly and very irregularly suffused with white; an oval dark fuscous spot in this representing plical stigma, and one rather smaller and less distinct representing second discal: cilia white speckled with dark fuscous, towards tornus pale greyish. Hindwings grey; cilia pale greyish.

TRANSVAAL, Pretoria, in February and March (Swierstra); three specimens.

Proterochyta n.g.

Head with appressed hairs; ocelli posterior; tongue long. Antennae $\frac{3}{5}$, in ♂ ciliated, basal joint elongate, rather swollen, with strong pecten. Labial palpi moderate, slender, smooth, porrected, terminal joint as long as second, pointed. Maxillary palpi rudimentary. Posterior tibiae clothed with long fine hairs above. Forewings with 2 from $\frac{5}{8}$, 3 from angle, 4 absent, 7 and 8 stalked, 7 to costa, 11 from middle. Hindwings nearly 1, lanceolate, cilia $1\frac{1}{2}$; 3 from angle, 4 absent, 5 rather approximated, 6 and 7 parallel.

Type *epicoena* Meyr., erroneously referred hitherto to *Elachista*; it is rather a puzzling form, but may perhaps be regarded as a primitive form of this family; the hindwings approach the Oecophorid type.

HYPONOMEUTIDAE

Prays citri Mill.

TRANSVAAL, Pretoria, in January (Swierstra); two specimens. A widely distributed pest of cultivated *Citrus*, not hitherto recorded from South Africa.

EPERMENIADAE

Idioglossa triumphalis n.sp.

♂ 14 mm. Head pale whitish-bronzy. Palpi bronzy-whitish, rather roughened anteriorly throughout, second joint somewhat expanded towards apex beneath. Antennae over 1, ochreous-whitish. Thorax whitish-ochreous, anteriorly suffused with ochreous-bronzy. Abdomen pale ochreous, with subbasal, antemedian, and subapical transverse lines of fuscous scales. Forewings narrow-lanceolate; deep ochreous-yellow; markings pale golden-metallic more or less edged laterally with coarse scattered dark fuscous scales, viz. small spots on costa at and near base, a quadrate spot in disc at $\frac{1}{5}$, its anterior angle connected with dorsum, an oblong spot in disc before middle and an elongate spot on dorsum beneath it, and rather large subquadrate spots in disc at $\frac{3}{8}$ and $\frac{5}{8}$: cilia ochreous-yellowish. Hindwings whitish-ochreous; a small bronzy-ochreous spot on middle of costa, a spot crossing wing at $\frac{3}{4}$, and an apical spot, with some coarse scattered golden-metallic and dark fuscous scales between these; cilia whitish-ochreous.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen.

LYONETIADAE

Opogona harpalea Meyr.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen. Described from Aldabra Island, and not hitherto known from the mainland.

Oinophila certa n.sp.

♂ 10-11 mm. Head whitish-ochreous, lower frontal tuft rather light brownish. Palpi fuscous. Antennae ochreous-whitish, base blackish. Thorax whitish-ochreous, patagia blackish. Abdomen ochreous-grey-whitish. Forewings narrow-lanceolate, very acute; blackish; a strong irregular-edged whitish-ochreous dorsal streak from base to apex, finely attenuated posteriorly but still very irregular, upper edge indented at $\frac{3}{4}$ of wing; cilia whitish-ochreous, on costa dark grey. Hindwings light grey; cilia ochreous-grey-whitish.

TRANSVAAL, Pretoria, in December and April (Swierstra); two specimens. Very similar to the Indian *oxymoris*, but in that species the lower frontal tuft is blackish, and the antennae are largely suffused with blackish on basal half, and have several indistinct narrow grey bands on apical portion.

TINEIDAE

Myrmecozela convallata n.sp.

♂ 14 mm. Head, palpi, and thorax ochreous-brown. Abdomen fuscous. Forewings elongate, costa moderately arched, apex obtuse, termen obliquely rounded; ochreous-brown, with about eight irregular transverse partially coalescing dark fuscous streaks, and some additional marks from costa: cilia dark grey, base spotted with brownish. Hindwings dark purple-grey; cilia grey, with indistinct darker subbasal shade.

TRANSVAAL, Moorddrift, in December (Swierstra); one specimen. Veins 7 and 8 of one forewing are stalked, of the other separate as usual in the genus.

Lysitona n.g.

Head rough-haired; ocelli posterior; tongue rudimentary. Antennae $\frac{4}{5}$, in ♂ simple, basal joint moderate, with projecting tuft of scales anteriorly. Labial palpi moderate, porrected, second joint loosely scaled, with some projecting lateral bristles at apex, terminal joint about as long as second, tolerably pointed. Maxillary palpi short, porrected, loosely scaled. Posterior tibiae clothed with long hairs above. Forewings with rough scale-tufts on surface; 2 from angle, 4 absent, 7 to costa, 11 from before middle. Hindwings $\frac{2}{3}$, lanceolate, cilia 2; 2-4 parallel, 5 and 6 stalked, 6 to costa, 7 parallel.

A derivative of *Tinea*.

Lysitona euryacta n.sp.

♂ 11 mm. Head and thorax white. Palpi dark fuscous, apex of joints white. Abdomen whitish-ochreous irrorated with grey. Forewings elongate, narrow, costa slightly arched, apex pointed, termen extremely obliquely rounded; brownish sprinkled with blackish; a broad white irregular-edged stripe occupying costal half of wing from base to $\frac{3}{4}$, costal edge blackish from base to near middle, and with a slight elongate mark of ground colour beyond middle; quadrate grey blotches extending from dorsum to white streak before and beyond middle of dorsum and on tornus, edged with blackish irroration, and a spot on middle of termen; cilia pale brownish-ochreous, towards base with a few blackish specks. Hindwings rather dark grey; cilia light greyish-ochreous.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen.

Crypsithyris insolita n.sp.

♂ 14 mm. Head pale ochreous. Palpi dark fuscous. Thorax pale ochreous, patagia dark fuscous except apex. Abdomen brownish, segmental margins whitish-ochreous. Forewings elongate, rather narrow, costa gently arched,

apex obtuse, termen very obliquely rounded; 2-4 approximated, 5 and 6 short-stalked, 7 and 9 stalked, 8 absent; light ochreous, coarsely and irregularly sprinkled with dark fuscous; costa suffused with dark fuscous anteriorly; an oval subhyaline spot in disc before middle; plical and second discal stigmata approximated, represented by round cloudy dark fuscous spots; cilia pale ochreous, sprinkled with dark fuscous. Hindwings with 2-7 separate; light grey; cilia pale greyish-ochreous, with indistinct grey median shade.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); one specimen.

Phyciodyta n.g.

Head rough-haired; ocelli posterior; tongue obsolete. Antennae $\frac{2}{3}$, in ♂ serrulate, pubescent, basal joint short, without pecten. Labial palpi moderately long, ascending, second joint beneath with very long dense rough projecting tuft and numerous long lateral projecting bristles, terminal joint shorter, slender, pointed. Maxillary palpi short, filiform, porrected. Posterior tibiae clothed with long hairs above. Forewings with numerous small tufts of rough scales; 1 *b* furcate, 2 from angle, 7 to costa, 7-9 approximated, 11 from before middle, secondary cell well-marked. Hindwings 1, elongate-ovate, cilia $\frac{2}{3}$; 2-7 separate, nearly parallel.

Belongs to the *Hapsifera* group.

Phyciodyta neritis n.sp.

♂ 17-20 mm., ♀ 28 mm. Head whitish-ochreous. Palpi whitish-ochreous, second joint suffused with brownish and irrorated with dark fuscous except apical edge, terminal joint with basal band and supramedian ring of blackish irroration. Thorax whitish-ochreous irrorated with dull greenish. Abdomen rather dark fuscous, anal tuft mixed with whitish-ochreous. Forewings elongate, costa moderately arched, apex obtuse-pointed, termen slightly sinuate, oblique; pale greyish-ochreous suffusedly irrorated with dull greenish; some small scattered blackish strigulae along costa; a more or less developed oblique-triangular blackish blotch on base of costa, from which sometimes an irregular blackish streak runs through middle of disc to apex; in ♀ three oblique dark brown fasciae from costa at $\frac{1}{3}$, middle, and $\frac{2}{3}$, reaching $\frac{2}{3}$ across wing, in ♂ obscurely indicated with dull greenish suffusion or obsolete; two or three large cloudy black dots on costa at apex: cilia whitish-ochreous speckled with blackish, towards base tinged with greenish, on lower half of termen more tinged with ochreous. Hindwings dark grey; cilia light grey, with darker subbasal line.

CAPE COLONY, Port St John, in October (Swinney); four specimens.

Hapsifera atrisecta n.sp.

♀ 21-22 mm. Head, palpi, and thorax pale greyish-ochreous finely speckled with whitish and fuscous. Abdomen whitish-ochreous speckled with grey. Forewings elongate, costa moderately arched, apex rounded, termen very obliquely rounded; 7 and 8 stalked, 9 separate; pale greyish-ochreous, irregularly sprinkled with grey, brownish, and dark fuscous; indistinct scattered strigulae of black irroration along margins; a blackish transverse mark on base of costa terminated by a tuft beneath fold; irregular oblique incomplete black lines crossing wing before middle and across end of cell, preceded by some tufts of scales, beyond second some irregular black longitudinal streaks or mottling forming a blotch on lower half of wing extending to termen: cilia pale greyish-ochreous speckled with whitish and grey, and indistinctly barred with blackish irroration. Hindwings grey; cilia light greyish-ochreous.

BRITISH S. E. AFRICA, Bela Vista, in November (Swierstra); three specimens. Closely allied to the widely distributed *rugosella*, with the same neurulation, but that species (of which I have seen numerous Indian and African examples) never shows the black markings of *atrisecta*.

Fumea luticoma n.sp.

♂ 11 mm. Head pale yellow-ochreous. Antennal pectinations 8. Thorax dark fuscous. Forewings elongate, moderate, costa moderately arched, apex obtuse, termen very obliquely rounded; dark fuscous, with faint purplish tinge; cilia concolorous. Hindwings and cilia dark fuscous.

CAPE COLONY, Port St John, in October (Swinney); one specimen.

ADELIDAE

Ceromitia holosticta n.sp.

♂ ♀ 14-15 mm. Head light ochreous, crown posteriorly white, face whitish-tinged. Palpi short, whitish. Antennae whitish ringed with fuscous. Thorax white, shoulders with a dark fuscous spot. Abdomen grey, apex whitish-ochreous. Forewings elongate, rather narrow, costa moderately arched, apex obtuse, termen very obliquely rounded; 8 and 9 sometimes connate or stalked; whitish, transversely strigulated with dark fuscous; an elongate dark fuscous spot on base of costa, less developed in ♀; two rather narrow irregular sometimes interrupted dark fuscous transverse fasciae; first at $\frac{1}{3}$, rather inwards-oblique from costa, second median, nearly direct; second discal stigma transverse, dark fuscous; cilia whitish-grey, mixed with whitish towards base. Hindwings with veins 5 and 6 connate or approximated; prismatic-grey; cilia whitish-grey.

TRANSVAAL, Pretoria, in December (Swierstra); three specimens.

A NEW SPECIES OF *WARBURGIA* FROM THE TRANSVAAL

By MRS R. POTT, Botanist of the Transvaal Museum.

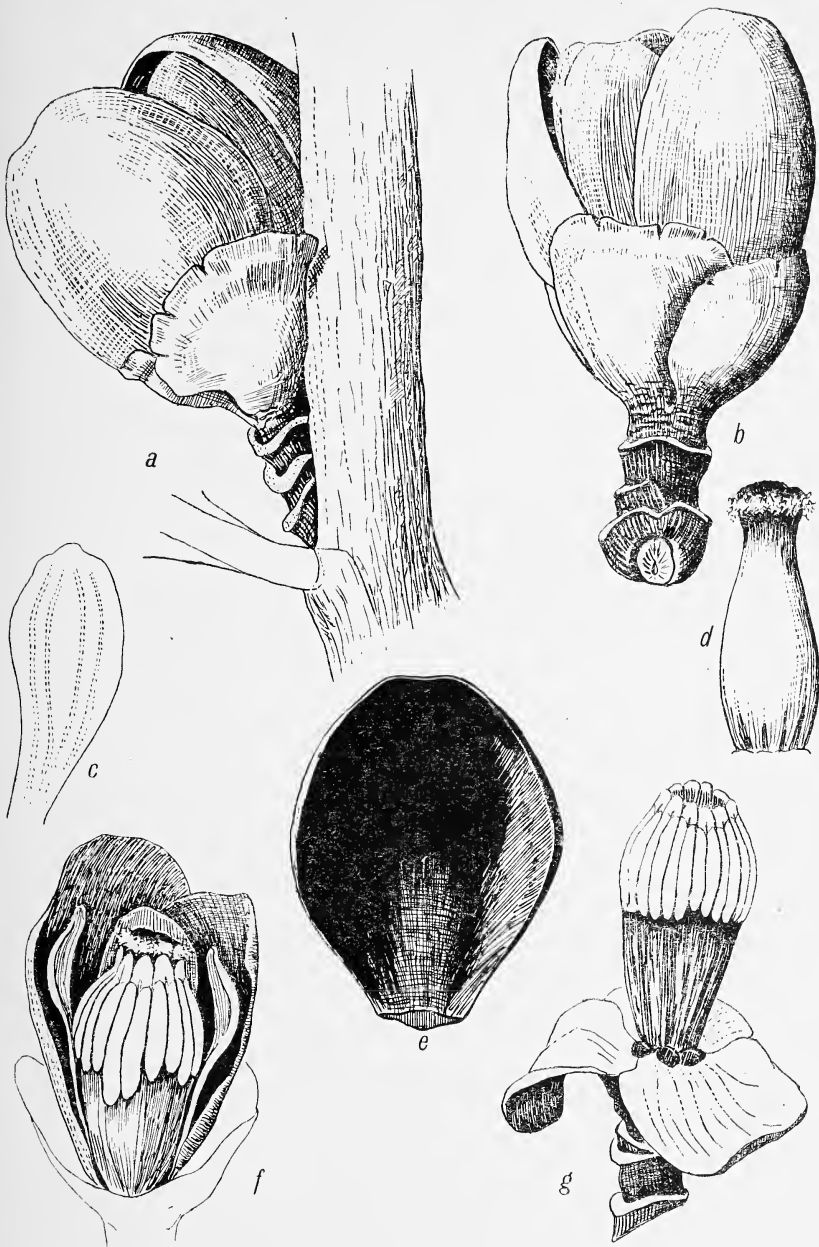
Warburgia Breyeri Pott n.sp.; a *W. ugandensis* Sprague, floris solitariis, ovulis placentis uniseriatim affixis recedit. Arbor 15 m. alta, cortice rugoso. Ramuli teretes, glabri, cortice striato ruguloso, lenticellis prominentibus. Folia alterna, exstipulata, subsessiles, penninervia, coriacea, glabra, supra nitidula, subtus paucè pallidiora, dense pellucido-punctata, integra, lanceolato-oblonga, 5–10 cm. longa, 1.5–2.5 cm. lata, acuta, basi attenuata, venis inconspicuis, subtus costa prominente. Flores parvi, axillares, solitarii, pedunculati, virides; pedunculus circa 2 mm. longus; bracteae circa 0.5 mm.



Text fig. 1. Flowering Branch of *Warburgia Breyeri* Pott.

longae, deciduae. Calyx persistens, sepalis 3, imbricatis, sub-orbiculatis, 2 mm. longis, 3 mm. latis, glabris, pellucido-punctatis, minute ciliatis. Petala exteriora 5, glabra, pellucido-punctata, sub-coriacea, obovata, concava, 5 mm. longa, 3 mm. lata; petala interiora 5, glabra, flavescentia, pellucido-punctata, spathulata, 4 mm. longa, 1.5 mm. lata. Tubus staminalis circa 3 mm. longus, apice decemcrenulatus; stamina 10; antherae extrorsae, 1.5 mm. longae, 1.5 mm. supra basim tubi sitae, longitudinaliter 2-valvatim dehiscentes. Ovarium oblongo-ovoideum, 2–3 mm. longum, 1 mm. diametro, glabrum, apice fimbriatum; stigma subsessile, subcapitatum, angulatum, truncatum; placentae 5, parietales, pluriovulatae, ovulis uniseriatis. Bacca immatura subglobosa, basi attenuata, 10 mm. diametro, pericarpio coriaceo ruguloso.

Hab. Transvaal, Western slope of Drakensberg, near Macoutsie River, Dr H. G. Breyer, no. 17573 in Transvaal Museum Herbarium. Flowering July and August.



Text fig. 2. Flower of *Warburgia Breyeri* Pott.

(a) Portion of stem with inflorescence. (b) Flower with peduncle. (c) Petal. (d) Pistil.
 (e) Sepal. (f) Longitudinal section of flower. (g) Staminal tube with calyx.

Tall tree, outer bark rough, inner bark of a reddish colour. Branches terete, glabrous, with ridged bark and prominent yellowish lenticels. Leaves alternate, exstipulate, subsessile, glabrous, glossy on upper side, a little lighter at the back, densely pellucid-dotted, entire, lanceolate-oblong, 5–10 cm. long, 1.5–2.5 cm. broad, broadly-acute, attenuate to the base, veins inconspicuous, midrib prominent at the back.

Flowers solitary, small, greenish, on short, stout peduncles in the axils of the leaves; peduncle 2 mm. long with prominent scars of the deciduous, broad-based bracts. Calyx persistent; sepals 3, overlapping, roundish, 2 mm. long, 3 mm. broad, glabrous pellucid-dotted, shortly ciliate on the margin. Outer petals 5, glabrous, pellucid-dotted, rather thick, obovate, concave, 5 mm. long, 3 mm. broad; inner petals 5, much thinner and lighter of colour, glabrous, pellucid-dotted, spatulate, 4 mm. long, 1.5 mm. broad. Staminal tube overtopped by the inner petals, 3 mm. long, crenulate at the top; stamens 10; anthers sessile on upper part of tube, 1.5 mm. long, opening to the outside with longitudinal slits. Pistil enclosed in staminal tube or just protruding, glabrous, fimbriate at the top; ovary oblong-ovate; stigma subsessile, subcapitate, truncate; placentation parietal, placentae 5, ovules in single rows. Young berry roundish, attenuate to the base; skin blackish-green, leathery, wrinkled, full with glands, 10 mm. diam.

This new species of *Warburgia* is nearest *W. ugandensis* Sprague, but the flowers are solitary and the ovules in one row on the placentae. It was discovered by Dr H. G. Breyer on the Letaba expedition of the Transvaal Museum, July, 1917. The species is named in honour of the collector. The native name of this tree is "Shibaha." The inner bark has a bitter, pungent taste. It is one of the Fever-trees of the low-veld, as the natives use the bark as a remedy against malaria fever; they hold the shibaha in great esteem. Scientific investigation will soon show whether it really possesses anti-malarial properties or not.

Anatomy. The cork-cells have rather thin walls. Oil-cells are found in the palisade and spongy tissue of the leaf and in the cortex, phloem and pith of the stem. Rosette crystals are plentiful in cortex and phloem. The wood is composed of tracheids with distinct bordered pits and scalariform vessels. The many medullary rays are 1–2 cells broad. Petiole with 3 fascicular bundles.

The above-stated characteristics agree well with those given for the family of Canellaceae in Engler and Prantl's *Natürliche Pflanzen-familien*, p. 315, III Teil, VI and VI a Abteilung.

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PART 3 *containing*

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Addenda I, II, III. (With 1 text figure)

Descriptions of some New Mammals. By AUSTIN ROBERTS

Some Notes on Birds, and Descriptions of New Subspecies. By AUSTIN ROBERTS

Issued April, 1919



PRINTED AT THE UNIVERSITY PRESS

CAMBRIDGE, ENGLAND

1919

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PART 3

DESCRIPTIONS OF NEW SOUTH AFRICAN
ARANEAE AND SOLIFUGAE

By JOHN HEWITT

With 4 plates and 13 text figures

CONTENTS

Ord. SOLIFUGAE.

Blossia laticosta sp. nov.

Blossia lamincornis sp. nov.

Ord. ARANEAE.

Fam. AVICULARIIDAE.

Acanthodon monticoloides sp. nov.

Acanthodon gracilipes sp. nov.

Acanthodon hirsutus sp. nov.

Acanthodon nigropilosus sp. nov.

Acanthodon mossambicus sp. nov.

Acanthodon hepburni sp. nov.

Key to the S. African species of
Acanthodon.

Heligmomerus caffer Purc.

Galeosoma mossambicum sp. nov.

Galeosoma planiscutatum sp. nov.

Galeosoma vandami circumjunctum
var. nov.

Galeosoma pluripunctatum sp. nov.

Galeosoma coronatum spherioideum
var. nov.

Galeosoma robertsi crinitum var.
nov.

Spiroctenus marleyi sp. nov.

Spiroctenus spinipalpis sp. nov.

Spiroctenus londonensis sp. nov.

Spiroctenus curvipes sp. nov.

Pelmatorycter breyeri sp. nov.

Pelmatorycter tookei sp. nov.

Stasimopus nigellus Poc.

Stasimopus tysoni sp. nov.

Euagrus caffer australis (Purc.).

Idiothele gen. nov.

Idiothele nigrofulvus (Poc.).

Idiothele pluridentatum sp. nov.

Pterinochilus breyeri sp. nov.

Ceratogyrus brachycephalus sp. nov.

Ceratogyrus dolichocephalus sp.
nov.

Fam. ZODARIIDAE.

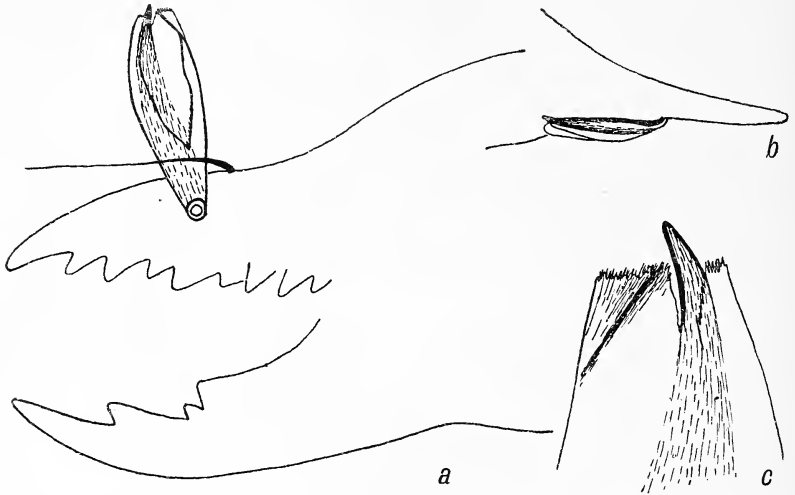
Diores godfreyi sp. nov.

Order SOLIFUGAE.

Blossia laticosta sp. nov. (text fig. 1 a-c).

The type of this species is a single adult male collected at Blauwkoop, Zoutpansberg dist., by Mr G. van Dam (10. viii. 1916). No species of this genus has been hitherto described from the Transvaal, and the relationships of *laticosta* to any of the species described from adjacent parts of S. Africa are not very obvious: it presents definite points of affinity to *B. unguicornis* Purcell, the type of which came from Dunbrody, Uitenhage dist. (*Annals S. African Mus.* 11. p. 214), but the complete absence of shaggy hairs from the surface of the flagellum will at once serve to distinguish the species.

Colour. Headplate, tergites and appendages with a dull reddish brown tinge. Metatarsus of palp more darkly coloured, and to a less extent also the distal half of the tibia.



Text fig. 1. *Blossia laticosta* sp. nov. a, Right chelicera of male viewed from mesial side. b, Anterior portion of upper jaw viewed from above. c, Distal portion of flagellum considerably magnified, viewed from side adjacent to the chelicera.

Headplate. The surface is covered with numerous short spinules and is completely devoid of long spines or bristles: there are several short stout spines scattered about near the margins, and a small group occurs in the neighbourhood of the eyes.

Tergites. On the three thoracic tergites long stout spines with bifurcated tips occur. The abdominal tergites are devoid of long setae or bristles except in the last segment. A few short spines occur on each of these tergites except the last and they are weak on the two penultimate tergites.

Pedipalp. On the lower surface of the metatarsus on its inner side is a row of 3 or 4 spines, and on the lower surface of the tibia are about half-a-dozen spines, some of them being slender and weak, the series being not definitely arranged in two rows.

Chelicerae. The upper surface carries stout spines most of which are slightly bifurcated at the tip, some being of moderate length and others short. The distal dorsal bristle is stout at the base and tapers finely to the apex, being

completely devoid of lateral setae or spinules throughout its course. In the upper jaw the two distal teeth are large, the third of moderate size, the fourth largest: besides, there are two rows of three each. In the lower jaw are two large teeth and one intermediate tooth of moderate size.

Flagellum. In side view the flagellum is more or less torpedo shaped and has no stalk. The membrane forms a closed cup in the basal third, but in the distal two-thirds the lateral margins of the membrane are merely infolded a little thus leaving a long broad opening on the mesial side of the capsule. There are no prickles or setae on this membrane, although the distal edges are slightly frayed and to a slight extent also the infolded edges proximally. There is a broad brown or yellow thickened rib running along the membrane on the side next to the jaw: this is quite sharply defined distally, and its bluntly pointed apex projects a little beyond the distal margin of the membrane: towards the basal portion of the flagellum it gradually broadens out and is not very sharply differentiated from the thin colourless membrane.

Modified hairs of second abdominal sternite. There is a cluster of three contiguous pink fleshy hairs on each side.

Measurements. Total length 11, length of flagellum .6, of tibia of palp 4.5.

I have examined a series of forty adult males of *B. unguicornis* Purcell, collected at Alicedale by Mr F. Cruden, and find that in each case the modified hairs of the second abdominal sternite comprise two pairs, as described in the type of that species. An examination of a retracted flagellum in dorsal view shows that the amount of free membrane dorsal to the rib is very much greater in *unguicornis* than in *laticosta*. Female specimens which are no doubt referable to this species were taken at N'jelele River by Dr Breyer and Mr G. van Dam (24 and 25. vii. 1916). They agree closely with the male in the dentition of the chelicerae: the colour characters are somewhat similar, the distal segments of the palp being infuscated, whilst the general colouration of the appendages and head plate is pale brown, without a reddish tinge. Total length 13.5.

Blossia laminicornis sp. nov. (text fig. 2 a-c).

The type of this species is a single adult male specimen collected at De Aar by Mr S. C. Cronwright-Schreiner.

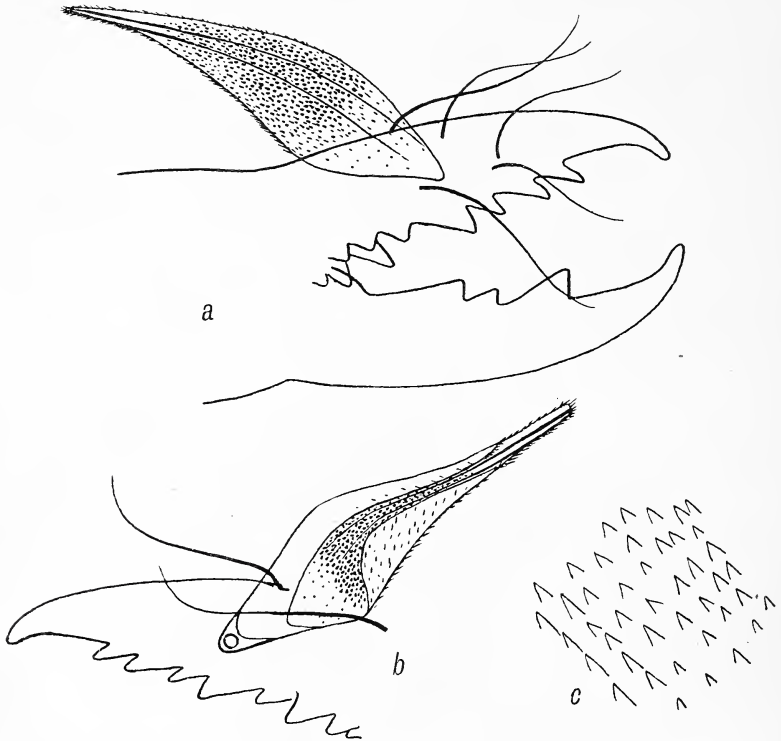
The species is closely related to *B. namaquensis* Purcell (*Annals S. African Mus.* II. p. 212), taken at Steinkopf, but seems to differ therefrom in the dentition of chelicerae and in shape of flagellum.

Dentition. In the upper jaw, the third tooth is of moderate size, being only a little smaller than the first and second teeth. The largest tooth of the single series is the fourth. In the basal portion of the fang, there is an outer row of three rather small teeth, and an inner row comprising two larger teeth and one small one, the latter, which is at the base of the series, being closely adjacent to one of the large ones. In the lower jaw the intermediate tooth is of moderate size.

Flagellum. This is a delicate membrane rotatably attached at its base to the inner mesial surface of the jaw. It is widest about the middle of its length, where its margins are strongly infolded on the side away from the jaw: towards the base, these infolded margins meet so that the basal part of the lamina forms a cup: distally, the membrane gradually narrows into its elongated apex. A thick yellow longitudinal rib runs the whole length of the organ, being slender and sharply defined distally, but broader and less clearly distinguishable from the adjacent membrane basally. The mesial portion of the

exterior surface of the membrane is closely studded with minute triangular denticles, except towards the base and on the narrowed distal portion. The margins for the most part are fringed with short stiff setae which also occur on the exterior surface of the infolded portions of the membrane: these are essentially elongated denticles.

Distal dorsal bristle of the upper jaw with only a trace of short fine lateral setose prickles in its distal part. It is precisely similar to the other bristles which occur on the outer and upper surfaces of the upper jaw: the bristle figured in text fig. 2 *b* along with the dorsal bristle is more distinctly setose along its length than the dorsal bristle. Near their apices these bristles are all quite smooth.



Text fig. 2. *Blossia lamnicornis* sp. nov. *a*, Right chelicera of male viewed from the outer side, showing flagellum and some of the long bristles which occur on the distal portion of the upper jaw. *b*, Upper jaw of same viewed from the mesial side. *c*, The denticles on the surface of the flagellum, highly magnified.

Tergites. On the first abdominal tergite, and to a less extent on the second and third, there are some short stout scattered spines: on the posterior tergites such spines do not occur, nor are the numerous short cylindrical bristles so long as the above mentioned spines.

Sternites. On the second sternite there is a pair of long curved fleshy hairs on each side. The hairs of each pair are closely approximated along their whole length. The pairs arise from adjacent points, near to the midline, and cross each other at their apices.

Pedipalp. The tibia of the pedipalp carries from three to six spines on the lower surface, and the metatarsus two. The cylindrical bristles on the dorsal surface of the tibia of the palp are very short in the basal half of the segment, long in the distal half.

Colour. The general colour is pale yellow.

Measurements. Total length 12.2, length of palp 15.5, length of flagellum 1.15.

An adult female captured at the same time has a general resemblance to the male, but the limbs are shorter and weaker. The third tooth of the upper jaw is of moderate size: the outer row comprises seven teeth and the inner row three, the two basal ones of the latter being close together: the intermediate tooth of the lower jaw is small. On the tibia of the pedipalp there are four long spines which are relatively weaker than in the male, and two or three occur also on the tarsus. The surfaces of the body are unfortunately too rubbed for descriptive purposes.

Total length 11, length of palp 9.4.

Order ARANEAE.

Family AVICULARIIDAE.

Acanthodon monticoloides sp. nov.

The types of this species are single specimens of the adult male and female collected at Pigg's Peak, Swaziland, by Mr A. Roberts (16. v. 1916). It is related to *A. monticola* mihi (*Annals Trans. Mus.* v. p. 185), but is easily distinguished therefrom in the absence of spinules or spinuliform setae on coxa III in either sex.

MALE.

Chelicerae. The inner row of teeth is represented by a single fairly large tooth: the main row has seven teeth.

Pedipalps. Tarsus with one long stout spine near the apex superiorly and several weaker ones. The band of spines margining the excavation of the tibia is interrupted in the middle: there are nine or ten spines distally and 10-14 proximally.

Legs. Coxa III with a strip of scattered setae along its post-ventral border, a few of these setae being much longer and rather stouter than the rest, though none can be described as spiniform. Tibia I scarcely stouter than the patella, except near the apex, but decidedly stouter than the metatarsus, equal to the metatarsus in length, its distal tubercle bearing a long flattened black process with rather blunt apex: there is a row of 3-5 rather weak spines along the outer side inferiorly. Metatarsus I not bent nor incrassated in any part of its length, practically straight: on the outer side inferiorly is a row of five long and fairly stout spines, and on the inner side inferiorly are two such spines. Tarsus I with one spine anteriorly and one or two posteriorly: inferiorly it is thinly scopulate. Tarsi II-IV all scopulate to the base. Band of spinules on anterior side of patella IV stretching over about three-fifths of the length of the segment and comprising only about a dozen spinules. Patella III with nine or ten spinules on the anterior surface, including the several short spines on the apical edge, also with one weak spine on the dorsal surface and two or three at the apex posterodorsally.

Sternum with three pairs of sigilla, the first pair being marginal.

Carapace. Length of ocular area a trifle greater than one-third of the distance from the anterior margin of the carapace to the fovea. Frontals about one-fifth of a diameter apart, subequal to the anterior medians. Posterior row in a procurved line, the medians being about $2\frac{1}{2}$ diameters apart but hardly $1\frac{1}{2}$ diameters distant from the laterals.

Measurements. Total length 13, length of carapace 5, breadth of carapace 4.7, length of tibia of first leg 4.7.

FEMALE.

The principal characters of the female are: sternum trisigillate, the first pair being a little removed from the margin: coxa III with stiffish setae along the postventral border: tibia II with nine or ten spines on its anterior side: patella IV with the band of spines on its anterior side stretching, with interruptions, almost to the end of the segment: tibia IV without distinct spines on the anterior surface except one or two at the apex inferiorly: chelicerae with one large tooth representing the inner row: ocular area only very slightly longer than one-third of the distance from anterior margin of the carapace to the fovea, frontal eyes about half a diameter apart but on a single tubercle, the eyes of the posterior row being related to each other much as in the female but the hind margins are more or less in one straight line. Total length 24, length of carapace 9, breadth of carapace 7.7. The colour of the female is dark chestnut brown on the carapace and appendages, the abdomen also infuscated: the male has a yellowish brown carapace and appendages.

Acanthodon gracilipes sp. nov.

Type. A single adult male from East London, collected by Dr Geo. Rattray in August 1916. The species is evidently closely related to *A. thorelli* O. P. Cambr., which is indefinitely located "S. Africa," but seems to differ therefrom in the character of the frontal eyes. It may also prove to be related to *A. hentanicus* Purcell, a species which is only known through the female type specimen.

Carapace. Anteriorly it is truncated, thus differentiating the anterior and lateral margins. In front of the fovea the carapace is rather strongly raised, and there is no distinct groove between the cephalic and thoracic regions; and indeed all the normal radiating grooves of the carapace are obsolete. The whole carapace is laterally compressed except in the posterior fifth. Ocular area almost but not quite as long as two-fifths of the distance from the centre of the fovea to the anterior margin of the carapace: frontal eyes about one-sixth of a diameter apart, considerably larger than the anterior medians: frontal quadrangle about as wide in front as behind: posterior row of eyes subequally spaced, or the distance between lateral and median slightly less than the distance between the medians: posterior margin of posterior row situated in a straight or slightly recurved line: posterior lateral eyes long and large, being decidedly larger than the anterior medians.

Legs. Tibia I slightly longer than metatarsus I, and not incrassated, its distal tubercle bearing a short pointed process. Metatarsus I not incrassated nor bent at any point, and viewed from the side it appears only very slightly bowed: on its outer side is a row of five spines, but on the inner side there are no spines nor stout bristles except the two spines at the apex. Tarsus I scopulate but not very strongly, without spines on either side. Patella III

with about twenty-four or twenty-five short spines on the anterior side, including those on the distal edge, also with a strip of about seven rather longer ones dorsally: IV with short spines over $\frac{3}{4}$ — $\frac{4}{5}$ of the length of the segment. Coxa III with a band of stiff setae on its post-ventral border, but the stiff setae are sparsely scattered in the distal half of the segment, and the band is only well defined in the basal half.

Pedipalp. Tibia about twice as long as deep, the excavation with the usual strip of short spines, which may be quite broken in the middle or more or less continuous. Tarsus with a group of stout spines at the apex superiorly.

Chelicerae. The main row of teeth includes 5–7 large teeth and one or two minute ones at the base of the series: in addition, there is a single large tooth on the inner side of this series, adjacent to the one or two minute teeth.

Colour. Carapace and appendages yellowish brown: abdomen superiorly somewhat infuscated.

Measurements. Total length 13, length of carapace 4.8, breadth of carapace 3.65, length of tibia I 5, of metatarsus I 4.4, of first leg 24.4, of second leg 19.6, of third leg 17.8, of fourth leg 25.5.

FEMALE.

The principal characters of the female are as follows: coxa III with a tuft of stiff setae on its post-ventral border, but the tuft is only compact in the basal half and even there is not so dense as in the females of *hirsutus*: sternum with two pairs of sigilla, the first pair being slightly removed from the margin: dentition of chelicerae as in the male: length of ocular area very slightly more than, or subequal to, two-fifths of the distance between the anterior margin of the carapace and the middle of the fovea: frontal eyes about one-quarter of a diameter apart and situated on a common tubercle which is grooved above, the frontal quadrangle being considerably broader in front than behind: posterior median eyes only a trifle nearer to the laterals than to each other, the posterior margins of the posterior row in a slightly recurved line: anteriorly, patella IV is spined over $\frac{3}{4}$ — $\frac{4}{5}$ of its length: the anterior margin of the carapace is well marked off from the lateral margin: the pair of long setae behind the ocular area is situated midway between the middle of the fovea and the anterior margins of the anterior median eyes. Total length 15.5, length of carapace 5.2, breadth of carapace 4.5.

Acanthodon hirsutus sp. nov.

The types of this species are four adult males collected at East London by Mr F. Cruden during June 1915. The species is related to *A. microps* mihi from Grahamstown, to *A. gracilipes* sp. nov., and to the Kentani species *A. kentanicus* Purcell. The adult males of these species—except that of *kentanicus* which is unknown—can easily be distinguished by the characters mentioned in the accompanying key, but the females are less sharply differentiated, and the only available points of distinction seem to be those presented by the fringe of stout setae on the inferior surface of coxa III and the ocular characters.

Carapace. Anteriorly it is truncated, the anterior and lateral margins being well differentiated. Except on the head region, the surface is depressed. The groove between cephalic and thoracic regions is well defined, over a portion of its length at least, and other radial grooves are present on the carapace.

Ocular area about two-fifths as long as the distance from the anterior margin

of the carapace to the centre of the fovea: frontal eyes about one-quarter of a diameter apart; posterior laterals nearer to the posterior medians than are the latter to each other: posterior margins of posterior row in a slightly procurved line.

Legs. Tibia I subequal to metatarsus I in length, and only slightly incrassated: distal tubercle bearing a short pointed process. Metatarsus I is slightly bowed when seen from the side: there is no marked bend or incrassation in its course, although there is faint indication of a bend near the base on the inner side but no spine in that neighbourhood: on the inner surface there is a number of stout bristles or spiniform setae which are only absent near the base of the segment, and distally there is usually a spine in addition to the one on the apical edge. Tarsus I strongly scopulate, with one or two spines on each side or such spines may be absent. Patella III with about 11-18 short spines on the anterior side, including those at the distal edge, but without any distinct spines dorsally though several stiff bristles occur there: IV with short spines over about one-half of the length of the segment and an odd one or two may also occur in the distal half of the segment. Coxa III with stiffish setae on its post-ventral border, the setae being sparsely scattered in the distal half and more densely aggregated proximally.

Pedipalp. Tibia about twice as long as deep, the excavation margined by a more or less continuous band of spines. Tarsus with one or several weak spines at the apex superiorly.

Colour. Carapace and legs pale yellowish brown, abdomen somewhat infuscated superiorly.

Measurements. Total length 9.8, length of carapace 4.4, breadth of carapace 3.5, length of tibia I 3.25, of first leg 18, of second leg 16, of third leg 13.8, of fourth leg 19.

FEMALE.

The principal characters of the female are as follows: coxa III with a dense broad tuft of stiff setae on its post-ventral border, the setae being fairly closely disposed even in the distal half of the segment: ocular area hardly two-fifths as long as the distance from the anterior margin of the carapace to the centre of the fovea, and the pair of long setae behind the ocular area is situated nearer to the anterior margin of the anteromedian eyes than to the centre of the fovea: frontal eyes about $\frac{1}{3}$ - $\frac{1}{4}$ of a diameter apart, situated on a low tubercle which is grooved above, the frontal quadrangle broader in front: posterior medians nearer to the laterals than to each other: posterior margins of posterior row of eyes approximately in a straight line: anteriorly, patella IV is spined over $\frac{3}{4}$ of its length: anterior margin of carapace well marked off from lateral margin: two pairs of sternal sigilla, the anterior pair submarginal. Total length 20, length of carapace 6.7, breadth of carapace 5.25.

Acanthodon nigropilosus sp. nov. (text fig. 3 a and b)

Types. An adult male and female from Arnheimburg, Carolina, collected by Mr A. Roberts (19. ix. 1915). The specific name has reference to the strong development of blackish hairs on the appendages and sternum of the female.

The characters of the adult male are as follows:

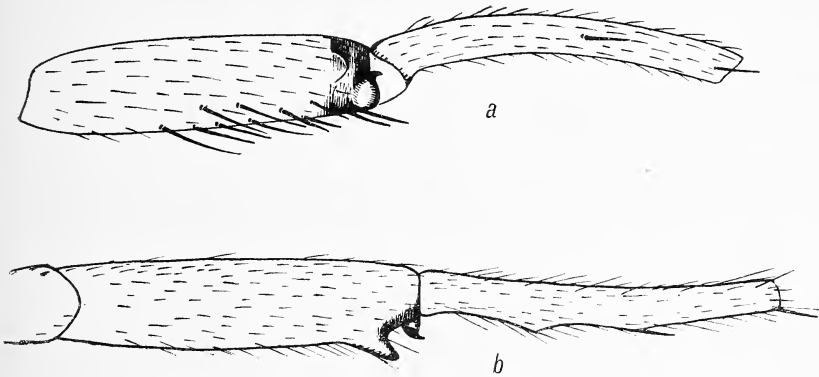
Colour. Carapace and appendages for the most part pale yellowish brown: abdomen purplish above: the membrane adjoining the margins of the carapace is also strongly tinted with purple.

Pedipalp. The tibia is about twice as long as deep, its excavation being

bordered by a continuous strip of spinules: altogether there are about thirty-two spinules. Tarsus with one strong spine and two weaker ones at the apex superiorly.

Chelicera. There is a single series of teeth, at the base of which on the inner side is a single moderate sized tooth: the single series comprises seven or eight teeth of which only the distal five are of moderate size, those at the base of the series being quite small.

Legs. Tibia I slightly shorter than metatarsus I, swollen but not greatly so: the two tubercles near the apex are large, but the distal one has only quite a short black pointed process at its apex: inferiorly, towards the posterior side, there is a strip of about seventeen spines, including those on the mesial part of the lower surface. Viewed from the side, metatarsus I is distinctly bowed: from above, it presents a distinct angular bend on the inner side at a point situated about one-third of its length from the base, and at a point two-thirds of the distance along the segment there is another bend but only very slight and hardly noticeable except as the point of origin of a spine, the only spine on the inner side except that at the apex: inferiorly there is a row of three



Text fig. 3. *Acanthodon nigropilosus* sp. nov. Tibia and metatarsus of first leg (left side), (a) from the mesial side, (b) in dorsal view.

spines towards the outer side and two at the apex. Tarsus I with three spines on the anterior side and five on the posterior side, inferiorly with rows of setae but not scopulate. Tarsus II-IV all scopulate to the base. Band of spinules on anterior side of patella IV only present in the basal half of the segment and comprising about six or seven spinules. Patella III with about 6-9 spinules on the anterior side, but none on the dorsal surface except one or two on the distal edge.

Carapace. The length of the ocular area is barely one-third of the distance from the anterior margin of the carapace to the fovea. Frontal eyes about one-fifth of a diameter apart; anterior medians subequal to the frontals: posterior row in a procurved line, the medians being rather more than $1\frac{1}{2}$ diameters apart and a little more than a diameter distant from the laterals.

Measurements. Total length 9.5 mm., length of carapace 3.65, of tibia of first leg 2.75, of metatarsus of first leg 3.1.

The chief characters of the adult female are as follows:

Legs. Coxa III with slender setae along the post-ventral border. Tibia II with 10-12 spines on its anterior side. Patella IV with the band of spines on

its anterior side stretching only half-way along the segment though an odd spine occurs in the naked area of the distal half. Tibia IV without spines on the anterior surface.

Chelicerae with a single row of teeth below and at the base thereof a single rather large tooth internally situated.

Ocular area subequal to or very slightly longer than one-third of the distance from the anterior margin of the carapace to the fovea: frontals about one-sixth of a diameter apart, not projecting strongly from the front margin of the carapace: posterior medians only very slightly nearer to the laterals than to each other, the distance between the medians about equal to $1\frac{1}{2}$ diameters. The head region of the carapace is marked with three longitudinal blackish lines, two of them tangential to the posterior-lateral eyes, and one of them being median: posteriorly they terminate at a point about midway between the ocular area and the fovea: the membrane at the margins of the carapace is also deeply pigmented.

Measurements. Total length 15, length of carapace 4.75, breadth of carapace 3.75.

The female resembles that of *A. crudeni* mihi, but, apart from the several minor structural differences which might not seem sufficient for specific separation on female characters alone, the two may be easily distinguished by the darker pigmentation of *nigropilosus*. The males are different in the characters of the first metatarsus, which in *crudeni* is not bent and is rather more elongated than that of *nigropilosus*.

Acanthodon mossambicus sp. nov.

The types are two adult males from Magude, Portuguese E. Africa, collected by Mr G. van Dam (2. vii. 1915). The characters are as follows:

Colour. Carapace and appendages pale yellowish brown, abdomen infuscated.

Sternum with three pairs of sigilla, the first pair submarginal.

Chelicera. A single row of teeth, at the base of which on the inner side is one large tooth, the basal teeth of the main series being small.

Pedipalp. The tibia is about twice as long as deep, the excavation bordered by stout spines or spinules which however are absent in the middle: the distal group includes about 5-8 spines and the proximal group about 8-10.

Tarsus, viewed from above, presenting a distinct lobe on each side distally.

Legs. Tibia I very slightly shorter than metatarsus I, swollen but not very greatly so: the two tubercles near the apex are large and the distal one bears a long black flattened process blunt at the tip: inferiorly, it carries a row of four spines on the outer side.

Metatarsus I almost straight, with one or two strong spines on the outer side inferiorly or none at all apart from those at the apex. Tarsus I with no distinct spines on the anterior side and with one or none on the posterior side, but on each side long spiniform setae occur: inferiorly it is thinly scopulate. Tarsi II-IV all scopulate to the base. Band of spinules on anterior side of patella IV stretching over about $\frac{3}{5}$ - $\frac{2}{3}$ of the length of the segment and comprising about eighteen spinules. Patella III with about 12-14 spinules on the anterior side, including those on the distal edge, but on the dorsal surface there are only one or two apart from those at the apex. Coxa III with a patch of stiffish setae on the inferior surface posteriorly.

Carapace. Length of ocular area subequal to, or very slightly greater than, one-third of the distance from the anterior margin of the carapace to the fovea. Frontal eyes about one-fifth of a diameter apart, very slightly larger than the anterior medians: posterior row in a procurved line, the medians being about $1\frac{3}{4}$ diameters apart and about a diameter distant from the laterals.

Total length 13.25, length of carapace 4.75, of tibia of first leg 4.1, of metatarsus of first leg 4.5.

There is another adult male example agreeing closely with the above from the junction of the Limpopo and Olifants Rivers, P.E.A., also collected by Mr G. van Dam (6. vii. 1915). In this example the third pair of sternal sigilla is only very faintly indicated: the eyes are a trifle larger than in the types, the anteromedians being subequal to the frontals: the fourth patella carries only about twelve spinules on its anterior side.

The species is no doubt related to *A. pectinipalpis* Purc. described from Zululand; the characters of the posterior row of eyes should serve to distinguish the two forms.

FEMALE.

The collection includes no females from Magude, but a series of small specimens from the junction of the Limpopo and Olifants Rivers and a single one of somewhat larger size from Papai are no doubt referable to *mossambicus*. The principal characters of the series are: sternum trisigillate: a strip of coarse setae on the post-ventral border of coxa III: ocular area slightly exceeding in length one-third of the distance from the anterior margin of the carapace to the fovea: frontal eyes about one-quarter of a diameter apart, or very slightly more: posteromedian eyes rather more or rather less than two diameters apart and about $1\frac{1}{2}$ diameters, or less, distant from the posterolaterals: patella IV only spined in its basal half or three-fifths anteriorly. The ocular characters vary according to the size of the individual, the frontals being always comparatively close together, and the posterior medians being always nearer to the laterals than to each other.

Total length of Papai specimen 18.5 mm., length of carapace 5.8, breadth of same 4.7: the largest specimen of the other series has a carapace 4.75 long.

Acanthodon hepburni sp. nov.

Type. A single adult male example from Majuba Nek, Herschel dist., C.P., collected by Mr Ivan Hepburn, B.A.

It is closely related to *A. spiricola* Purcell, found at Kentani, but can be distinguished at once by the characters of the ocular area.

Carapace. Anterior margin truncated. Radiating grooves obsolete, represented by short shallow depressions. Ocular area about as long as one-third of the distance from the anterior margin of the carapace to the centre of the fovea. Frontal eyes almost one-third of a diameter apart, and fairly large, being decidedly larger than the anteromedians, the frontal quadrangle being quite as broad in front as behind: dorsal cleft between the two frontal eyes fairly deep. Posterior median and posterior lateral eyes closely approximated, the distance between the medians being more than twice the distance between median and lateral: the posterior lateral moderately long, but smaller in area than the anterior median.

Legs. Tibia I slightly longer than metatarsus I and not incrassated, its distal tubercle bearing a short pointed process. Metatarsus I is decidedly

bowed in side view, and, seen from above, appears very slightly bent outwards at a point near to the base: on the outer side is a spine at the apex, and a few bristles or stiff setae along the length of the segment: on the inner side is a series of bristles, but no spines except one at the apex. Tarsus I thinly scopulate and without spines. Patella III with five or six short spines on the anterior side superiorly, including those on the distal edge, but with none dorsally except for a short weak one near the distal edge. Patella IV with five short spines on the basal portion of the segment. Coxa III with a few stiff setae on the post-ventral border, but these setae do not form a conspicuous tract.

Pedipalp. Tibia about twice as long as deep, the excavation armed with a continuous strip of short spines: tarsus with one or two weak spines at the apex superiorly.

Chelicerae. There is a main row of seven teeth and near the base of the series on its inner side is a single large tooth.

Colour. Carapace and appendages yellowish brown: abdomen superiorly slightly infuscated.

Measurements. Total length 10 (approx.), length of carapace 3.5, breadth of carapace 2.75, length of tibia of first leg 3, of metatarsus of first leg 3.25, of first leg 16.5, of second leg 13.75, of third leg 11.5, of fourth leg 15.5.

FEMALE.

Four female examples from the same source present the following characters: coxa III with a thin and inconspicuous strip including a few stiffish setae on its post-ventral border: two pairs of sternal sigilla, the first pair being slightly removed from the margin: dentition essentially similar to that of the male, the main row comprising four large distal teeth, two small teeth and two minute proximal teeth, internal to which is situated a single large tooth: length of ocular area very slightly less than one-third of the distance between the anterior margin of the carapace and the centre of the fovea: frontal eyes about $\frac{3}{4}$ -1 diameter apart, situated on a common tubercle which is deeply grooved above, the frontal quadrangle being about as broad behind as in front: posterior median eyes decidedly nearer to the laterals than to each other: a line tangential to the anterior median and posterior lateral eyes in front is very markedly recurved, and the hind margins of the posterior row are in a procurved line: anteriorly, patella IV is spined in the basal half: anterior margin of carapace fairly well marked off from the lateral margin and mesially it may project forwards considerably: the pair of long setae behind the ocular area is situated a little further from the middle of the fovea than from the anterior margin of the anterior median eyes: general colouration olive brown. Total length about 15.5, length of carapace 6, breadth of carapace 4.7, distance from centre of fovea to anterior margin of carapace 3.75, distance from centre of fovea to hind margin of posterior median eyes 2.55.

The female of *A. spiricola* is very similar thereto, but the ocular area is still shorter, and the line joining the anterior margins of the anterior median and posterior lateral eyes is practically straight. A full sized specimen has the following measurements: length of carapace 6.2, distance from centre of fovea to anterior margin of carapace 3.9, distance from centre of fovea to hind margin of posterior median eyes 2.85.

Preliminary Key to the S. African species of the genus Acanthodon
(= *Ctenolophus* Purcell + *Gorgyrella* Purcell) based on the characters of
adult Males.

1. *Tibia I longer than metatarsus I.*

(a) *Tibia* of palp about twice as long as deep, the excavation with a more or less continuous strip of short spines arranged in a single row in the middle. Band of spines on anterior surface of patella IV stretching the whole length of the segment but in the distal three-fifths there is only a single row and the distal spine is a good distance from its neighbour; III with about eighteen spinules anteriorly, including those on the distal edge. Ocular area extending over about one-third of the distance between the anterior margin of the carapace and the fovea: frontal eyes about one-quarter of a diameter apart or a trifle more: posterior medians two diameters apart or slightly more and $1\frac{1}{2}$ diameters or a little less distant from the posterior laterals. *Tibia I* 4.25 mm. long, metatarsus I 3.75 mm. (loc.?). *A. thorelli* O. P. Cambr.¹

(b) Frontal eyes one-sixth of a diameter apart. (For other characters see description.) [East London.] *A. gracilipes* sp. nov.

2. *Tibia I subequal to metatarsus I.*

A. With two pairs of sternal sigilla.

(a¹) *Tibia I* only slightly incrassated, the distal tubercle bearing a short black pointed process: metatarsus I practically straight and not incrassated or bent at any point: tarsus I only weakly scopulate, without spines on either side or only one weak one posteriorly. Patella III with a band of about twenty spines on its anterior surface and a strip of six or seven weaker ones dorsally, apart from those on the distal edges; IV with short spines over $\frac{3}{4}$ — $\frac{4}{5}$ of the length of the segment. Coxa III with a band of stiffish setae along its post-ventral border. *Tibia* of palp a trifle more than twice as long as deep, the excavation bordered by a continuous band of spinules: tarsus with a group of spines at the apex superiorly. Ocular area extending a little more than one-third of the distance from the anterior margin of the carapace to the fovea: frontal eyes about one-quarter of a diameter apart, larger than the anterior medians, the quadrangle formed by these four eyes being very slightly wider in front. Length of carapace 5.3 mm., of *tibia I* 5.15. (Grahamstown.)

A. microps Hewitt.

(b¹) Similar to *microps* but smaller (length of carapace 4.5), and differing as follows: metatarsus I seen from the side is distinctly bowed, and the inner lateral surface carries a number of stout bristles or spiniform setae (wanting in *microps*), only absent near the base of the segment: tarsus I strongly scopulate. (East London.) *A. hirsutus* sp. nov.

(c¹) Metatarsus I very distinctly curved proximally when seen from the side, concave also internally at the base and slightly incrassated internally at the end of the basal fourth, the eminence bearing one short spine and 3–4 stout spiniform setae. Excavation of *tibia* of palp furnished with a broad semicircular band of short close-set spinules. Area formed by the frontal and anterior median eyes very slightly wider in front than behind. (Durban.)

A. cregoei Purcell².

¹ I have examined the type in the British Museum.

² Species unknown to me.

B. With three pairs of sternal sigilla.

(aⁱⁱ) Metatarsus I only very slightly bowed, not bent nor incrassated in any part of its length, carrying on the outer side inferiorly a row of five or six spines including those at the apex. Tibia I only a little stouter than the metatarsus, its distal tubercle bearing a long pointed black process. The spines margining the excavation of the tibia of the palp not forming a continuous band, the strip being interrupted in the middle. Coxa III with a band of scattered stiffish setae along its post-ventral border, those more basally situated being shorter and more or less subspiniform. (Magaliesberg, near Pretoria.) [It is related to the species under 3 A but the process on the distal tubercle of tibia I is more slender.] *A. monticola* Hewitt.

(bⁱⁱ) The process on the distal tubercle of tibia I is strongly flattened and obtuse at the apex. Coxa III without subspiniform setae in the band of setae on its post-ventral border. (Pigg's Peak.) *A. monticoloides* sp. nov.

3. *Tibia I shorter than metatarsus I* (only very slightly so in *crudeni*).

A. Three pairs of sternal sigilla. Distal tubercle of tibia I bearing an elongated flattened black process, rounded or blunt at the end.

(aⁱⁱⁱ) Metatarsus I slightly bowed when viewed from the side but not bent nor incrassated in any part of its length. Frontal eyes about one-third of a diameter apart or a trifle less, the frontal quadrangle of the ocular area broader behind than in front, the posterior medians being much nearer to the laterals than to each other. (Alicedale.) *A. abrahami* Hewitt.

(bⁱⁱⁱ) Metatarsus I arcuate in its basal half, with concavity looking inwards, strongly bent in the middle. Frontal eyes quite separate, about one-half a diameter or more apart, the frontal quadrangle being appreciably wider behind. (Jansenville.) *A. ochreolum* Pocock.

(cⁱⁱⁱ) Metatarsus I with a distinct bend at a point about one-third of its length distant from the apex. Coxa III with a patch of sharp rather weak spinules in its basal half posteriorly below. (Roodeplaat, near Pretoria.) *A. schreineri minor* subsp. nov.

(dⁱⁱⁱ) Metatarsus I almost straight or very slightly curved, without concavity or thickening near the base on the inner surface. Excavation of tibia of palp armed with a semicircular band of stout spines. Frontal eyes very close together, the area formed by the frontal and anterior medians being parallel sided or wider behind, the posterior medians almost or quite as far from the laterals as from each other. (Zululand.) *A. pectinipalpis* Purcell¹.

(eⁱⁱⁱ) Metatarsus I almost straight. Excavation of tibia of palp not armed with a continuous strip of spines, but with a distal group of 5-8 and a proximal group of 8-10. Frontal eyes about one-fifth of a diameter apart: posterior medians about $1\frac{2}{3}$ diameters apart and about a diameter distant from the laterals. (Magude, P.E.A.) *A. mossambicus* sp. nov.

¹ The Transvaal Museum has an example from Malelane which is perhaps referable to this species. Metatarsus I has a slight but distinct bend about the middle of its length, and on the outer side is a row of three or four spines. The excavation on the palpal tibia has a distal group of 8-10 spines and a basal group of ten or eleven. Posterior median eyes quite $1\frac{1}{2}$ diameters distant from the laterals, and about $1\frac{2}{3}$ diameters apart: frontals about one-quarter of a diameter apart. Length of carapace 6.75. [Coll. 24. vi. 1916 by Mr A. Roberts.]

B. Only two pairs of sternal sigilla. The black process on the distal tubercle of tibia I is short and pointed.

(a^{iv}) Metatarsus I not incrassated internally at any point, but seen from the side it is curved near the base. Excavation of tibia of palp with a continuous band of short spines. Ocular area extending scarcely more than one-quarter of the distance from the anterior margin of the carapace to the fovea: frontal eyes separated, about two-fifths of a diameter apart, the frontal quadrangle being slightly wider behind, the frontal and antero-median eyes subequal in area. (Kentani.)
A. spiricola Purcell.

(b^{iv}) Similar to *spiricola*, but ocular area a little longer, reaching almost one-third of the distance from the anterior margin of the carapace to the centre of the fovea: frontal eyes decidedly larger than the anteromedians. (Majuba Nek, Herschel dist.)
A. hepburni sp. nov.

(c^{iv}) Metatarsus I decidedly curved and there is a slight incrassation on the inner side near the base, this thickened region being without spines although superiorly and laterally stiffish bristles extend therefrom up to near the apex of the segment. Excavation of tibia of palp with a more or less continuous band of short spines, weak in the middle. Frontal eyes very close together, the area formed by the frontals and anterior medians being much wider behind than in front. Ocular area extending about one-third of the distance from the anterior margin of the carapace to the fovea. Seen from above, the lateral and front margins of the carapace form a fairly sharp curve anteriorly, the anterior margin not being strongly truncated. A small form with carapace only 3 mm. long. (Based on two specimens collected at East London by Mr F. Cruden, the type of the species occurring near Grahamstown.)
A. flaveolum Poc. (var.)¹.

(d^{iv}) Metatarsus I slightly incrassated internally near the base, the thickened region being beset with stiff bristles but no spines: seen from the side it is curved near the base. Band of short spines bordering the excavation of the tibia of the palp broken a little in the middle. Carapace not strongly truncated anteriorly. Frontal eyes very close together, the area formed by frontals and anterior medians being very distinctly wider behind than in front: ocular area a trifle longer than one-third of the distance from the anterior margin of the carapace to the fovea. (Alicedale.)
A. crudeni Hewitt.

(e^{iv}) Metatarsus I with a weak but distinct angular bend on the inner side at a point about one-third of its length from the base, and at a point two-thirds of the distance along the segment is another bend but only very slight and hardly noticeable except as the point of origin of a spine. Tibia I swollen but not greatly so. Tarsus I with three spines on the anterior side and five on the posterior side. Frontal eyes about one-fifth of a diameter apart, the frontal quadrangle being decidedly wider behind than in front. (Arnheburg, Carolina dist.)
A. nigropilosus sp. nov.

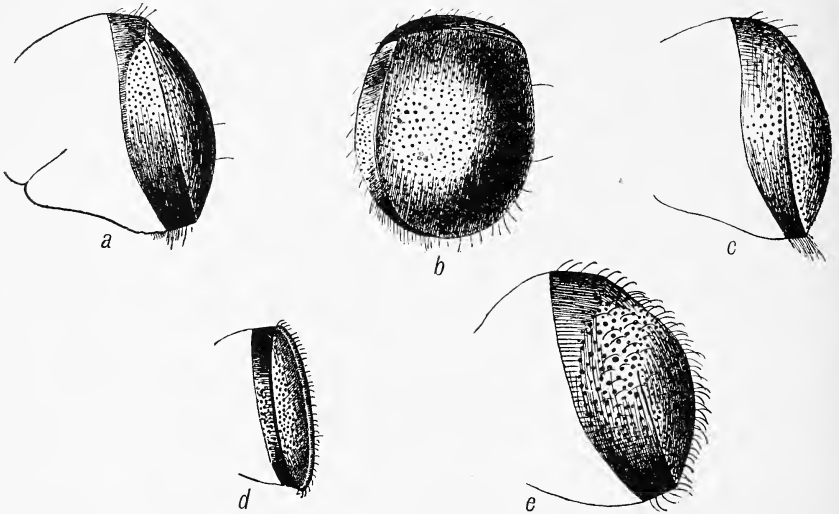
¹ The female closely resembles *flaveolum* from Grahamstown, the frontal eyes being very near together on a strongly raised common tubercle which projects forwards anteriorly and has no median cleft superiorly or only a slight one. The length of the ocular area is about one-third of the distance from the anterior margin of the carapace to the fovea, being very slightly greater than in typical *flaveolum*.

Heligmomerus caffer Purcell ? sp.

A very fine female example was taken at Ma Shangani (4. viii. 1916) by Mr G. van Dam. The carapace is 13.9 mm. long and 12.75 broad. The distance between the posterior median eyes is almost twice as great as the distance between posterolateral and posteromedian. It thus appears to be different from the Moorddrift and Bulawayo forms previously recorded.

Galeosoma mossambicum sp. nov. (text fig. 4 a and b).

Types. A series of female examples from Mazambo and from Papai, localities in Portuguese East Africa, collected by Mr G. van Dam in July 1915. The species is closely related to *G. vandami* mihi (text fig. 4 c), from the neighbourhood of Leydsdorp, differing therefrom in the form of the shield.



Text fig. 4. *a*, *Galeosoma mossambicum* sp. nov. Abdominal shield in side view. *b*, *Galeosoma mossambicum* sp. nov. Abdominal shield in dorsal view. *c*, *Galeosoma vandami* Hwtt. Abdominal shield in side view of specimen from Griffin Mine, Leydsdorp. *d*, *Galeosoma planiscutatum* sp. nov. Abdominal shield in half side view. *e*, *Galeosoma coronatum* Hwtt. Abdominal shield in side view.

Abdominal shield. The upper surface is lightly and fairly uniformly convex: its outline is almost a regular oval, except that in front there is a distinct angle on either side, the front portion being less strongly curved than the corresponding portion posteriorly. The marginal surfaces are well marked off from the upper surface all round, the line of junction being marked by a distinct ridge which in front is quite sharp though not definitely upturned: the ridge is only a little stronger posteriorly than anteriorly. Viewed from the side, the marginal surface is considerably deeper in the middle than in front or behind. This marginal surface is composed of two portions fairly sharply marked off from each other: the anterior portion is not conspicuously punctured nor glossy, being closely covered with short fine hairs; the posterior portion, which extends forwards on either side as far as the anterior angles of the boundary of the upper surface, is glossy and coarsely punctured. The anterior dull portion which occupies the whole depth of the marginal surface anteriorly is continued backwards along the sides of the shield as a thin strip at the base

of the glossy portion, the two surfaces blending in the hind quarter of the shield. At the sides, the glossy portion is obliquely inclined in relation to the dull basal strip or to the upper surface with which latter it forms an obtuse angle. The upper surface of the shield is almost completely devoid of hairs: several occur on the lateral edges and one or two on the internal portions of the surface. The glossy part of the marginal surface is also devoid of hairs except in its posterior half where basally a fairly dense group of bristly hairs occurs on each side. Dorsally, the soft skin of the abdomen immediately anterior to the shield presents several transverse rows of closely approximated short fine setae and ventrolaterally in the immediate neighbourhood of the shield there are numerous obliquely arranged lines of setae.

Measurements. Total length 16, length of carapace 7, breadth of carapace 5.2, length of shield measured along the upper surface 8.4, breadth of shield measured across upper surface 6.3, anterior depth of shield 1.4, posterior depth of shield 1.4, greatest depth of shield (measured about the middle point of its length) 2.2.

The adult specimens from Papai are noteworthy in that the glossy lateral and posterior surfaces of the shield are completely devoid of hairs which is not the case in any of the Mazambo examples.

Galeosoma planiscutatum sp. nov. (text fig. 4 d).

The types of this form are four rather small female examples from Buffelsdraai, Pretoria dist., collected by Mr A. Roberts (17. iv. 1916). These specimens are without doubt adult, although considerably smaller than the adults of other known species. The form of the shield of any species though very constant in adult specimens collected in one locality, may vary considerably according to the maturity of the individual and eventually it may be found impossible to distinguish between the various species except in the fully adult stages. The species here described belongs to the group which includes *pallidum*, *pilosum* and *hirsutum*.

Shield. The upper surface is broadly oval or almost round in outline and quite flat, except near the margin where it is strongly upturned all round: it is fairly regularly covered with shallow punctuations the largest of which are a pair situated at points about one-third or two-fifths of the total length distant from the posterior end, the distance between these sigilla being about half the distance of either from the margin of the surface or at any rate not so great as that distance: anteriorly, there may or may not be another pair of sigilla but in any case they are not so distinct, their distance apart being equal to or somewhat greater than their distance from the posterior pair but much greater than their distance from the margin of the surface. The general surface carries numerous short fine setae but no long ones: on the upturned edge however there are longer stiffish setae. The marginal surface is fairly uniform throughout, being pitted and somewhat roughened, not polished: in the anterior half it is hairy, but only very sparingly so in the posterior half except just at the posterior extremity: it is for the most part at right angles to the upper surface except posteriorly where the two surfaces are more acutely inclined to each other. The depth of the marginal surface is relatively small and is least posteriorly. In front of the shield superiorly the soft skin of the abdomen presents well defined rows of setae.

Carapace. There is a very long stiff bristle arising from between the anteromedian eyes, a pair of shorter and weaker ones between the posteromedians, a single weak one just behind the frontal eyes, and a pair of long ones behind

the ocular area just about midway between the median weak bristle and the fovea.

Measurements. Length of carapace 4·7, breadth of carapace 3·6, length of upper surface of shield 6·5, breadth of upper surface of shield 5·8, anterior depth of shield 1·2, posterior depth of shield ·8.

Mr A. Roberts has collected at New Mukelneuk two quite small examples of *G. hirsutum* which in the flatness and shape of the upper surface closely resemble the species now described: they differ in the pronounced hairiness of the shield and in the much greater depth of the marginal surface. The resemblance to *planiscutatatum* is still more pronounced in three minute specimens from New Mukelneuk: these have the flat upper surface quite devoid of stiff hairs though fairly long delicate hairs occur there.

A flat upper surface, bounded all round by an upturned edge, is also met with in some specimens from Lyttelton Junction and from Garstfontein: these differ from *planiscutatatum* in the greater depth of the marginal surface and in the absence of distinct rows of setae on the upper surface of the abdomen, anterior to the shield.

Galeosoma vandami Hwtt. var. nov. *circumjunctum* (text fig. 4 c, Pl. IV, figs. f and g).

This form is founded on two subadult and one juvenile specimen taken at N'Wanedzi River, Zoutpansberg dist., by Mr G. van Dam (18. vii. 1916). It differs from the typical form of *vandami* in that the ridge separating the two surfaces is quite complete all round, being well developed, upturned, and quite sharp anteriorly. The upper surface is also a little more flattened than in that form, but a more characteristic feature of the present specimens is the occurrence of three pairs of long bristly hairs, each hair arising from a slight eminence on the dorsal surface: the position of these is indicated on Pl. IV, figs. f and g.

Apart from these, the upper surface of the shield is devoid of long hairs, though numerous very fine short hairs occur there. Similar long hairs occur in the typical form of *vandami*, but the hair pits from which they arise are not raised or scarcely so: sometimes four pairs of stiff setae are present.

Measurements. Total length 18; length of upper surface of shield 8; breadth of upper surface of shield 7·5; depth of marginal surface anteriorly 1·5; depth of marginal surface posteriorly 1·15; distance of base of first hair from anterior margin of shield 2·8, of second hair from anterior margin 5, of third hair 6·4.

I take this opportunity of giving more complete measurements of the shield of *vandami* than were included in the description of that species: specimen from Griffin Mine (Pl. IV, fig. e), length of upper surface of shield 8·5, breadth of upper surface 7·5, depth of marginal surface anteriorly 1·9, depth of marginal surface posteriorly ·8, depth of marginal surface about the middle of its length 1·7.

In a series of six specimens from Gravelotte the ridge of the shield is usually quite obsolete anteriorly: in one or two cases it is weakly indicated, the marginal region in front, as elsewhere, including a glossy and punctured secondary surface as well as the primary marginal surface.

Two specimens referable to this species have been taken recently at Ngwaribango, Letaba River, about twenty-five miles N.W.N. of Leydsdorp: they are approximately typical, but the shield is large and the marginal surfaces well defined and deep although the ridge of separation is not stronger

than usual: the depth of the marginal surface at about the middle of its length is 2.15, and at this point the two surfaces are well inclined: the punctuations of the marginal and dorsal surfaces are not very coarse and do not tend to merge in pairs forming coarser pits.

A single example from Shiny (about twenty-seven miles E. of Gravelotte) probably represents a distinct variety. It is more coarsely punctured on the marginal and dorsal surfaces than in other forms of the species, and the punctures tend to run together into larger pits. The marginal surfaces are not deep, and the ridge of separation is absent anteriorly. The depth of the marginal surface at about the middle of its length is 1.8, the two surfaces being very obliquely inclined to each other at this point: greatest length of shield 9.3.

A fairly typical example was taken at Silwane (about thirty-three miles E. of Gravelotte) by Mr G. van Dam. This was accompanied by two very small specimens which differ from the larger adult example in presenting sharply defined and continuous marginal surfaces, and very flat dorsal surfaces: three or four pairs of stiff setae occur on the dorsal surface as in adults.

Galeosoma pluripunctatum sp. nov. (Pl. IV, fig. d).

The type is a single adult female example from Mooi Vley, Rustenburg dist. (W. Powell). It is closely related to *schreineri* from De Aar, and *vandami* from the neighbourhood of Leydsdorp, and may be regarded as a connecting link between those two species. The upper surface of the shield is however more closely and finely pitted than in either of the above, and this constitutes the most distinguishing character of the species. That surface is quite devoid of long stiff hairs or bristles except for a pair in the anterior half—in *schreineri* long stiffish hairs are fairly numerous—and except for the punctures is levelled smooth and glossy. The marginal ridge between the upper and lateral surfaces is on the whole like that of *schreineri*: posteriorly it is sharp and slightly up-turned, whilst anteriorly it is practically obsolete as a distinct ridge though there is a well defined angle between upper and marginal surfaces, this angle amounting to only a trifle more than 90° mesially. (In *schreineri* (Pl. IV, fig. c) the ridge itself though blunt is perfectly distinct anteriorly and the anterior angle mesially is considerably more than 90° : in typical *vandami* the ridge is absent and the angle not well defined.) The upper surface of the shield is only moderately convex, being more flattened than in typical *vandami* or *schreineri*. The distance between the posterior median eyes is only a trifle greater than the distance between the posterior median and posterior lateral: thus it approaches *schreineri* rather than *vandami*, apparently. However, ocular characters are not altogether trustworthy when dealing with a limited amount of material.

Measurements. Total length 17, length of upper surface of shield 8.9, breadth of same 8.25, depth of marginal surface anteriorly 1.75, depth of same posteriorly 1.1, depth of same at the middle of its length 1.65.

Galeosoma coronatum Hewitt (text fig. 4 e, Pl. IV, fig. a).

Two female examples, representing a fairly distinct variety, have been taken on the town lands adjoining the experimental farm at Potchefstroom (G. van Dam and A. Roberts). In the original description of this species it should have been stated that a true primary marginal surface is present on the shield, but is moderately deep only in front where it is clearly separated from the more glossy coarsely punctured adjacent surface, although a sharply defined

boundary ridge is not present: this marginal surface rapidly narrows in passing ventralwards but is continuous throughout as a more or less definite though very narrow marginal strip free of coarse punctuations. There is also a much deeper secondary marginal surface, very coarsely pitted, which in the posterior half of the shield is delimited by a distinct ridge in the type: it is glossy and hairy like the dorsal surface, of which indeed it is a part: in the Potchefstroom specimens, however, it is less noticeable owing to the absence of the ridge of separation between dorsal and secondary marginal surfaces, but, on the other hand, the primary marginal surface is rather more sharply defined but not deeper than in the type. The shield of these Potchefstroom specimens is decidedly more hirsute than in the type, thus approaching *hirsutum*, where, however, the relationships of dorsal and lateral surfaces are quite different. Although the posterior ridge is absent in this variety yet, a deep secondary lateral surface may be recognised especially posteriorly, and in fact, as in the typical form, constitutes a complete but very indistinct girdle, the curvature of the superior surfaces being greatest along the subcircular line of junction: in the smaller example, these two surfaces in the mesial line posteriorly may be said to be angularly inclined to each other at about 120° , the secondary marginal surface being not curved, but in the larger specimen the angle is greater, and the two surfaces merge to a greater extent. This variety I now designate *Galeosoma coronatum* var. *spheroideum*. Total length of the shield 10.8, greatest breadth 8.2, anterior depth of true marginal surface 2.4, posterior depth of same .4.

Galeosoma robertsi Hewitt (Pl. IV, fig. b).

Four female examples have been taken on the town lands adjoining the experimental farm at Potchefstroom (G. van Dam and A. Roberts). The ridge separating dorsal and secondary marginal surfaces is quite well developed, extending into the anterior half of the shield. Otherwise, they do not differ appreciably from Pretoria specimens of this species.

At Venterskroon (about twenty miles S.E. of Potchefstroom) Mr van Dam has found two specimens representing a distinct form of this species. These examples chiefly differ from the typical form of *robertsi* in the possession of long hairs on the upper surface of the shield: the hairs are rather sparsely distributed, being not quite so abundant as those on the shield of *coronatum typicum*. This variety may therefore be known as *Galeosoma robertsi* var. *crinitum*. The primary marginal surface in the typical form of *robertsi* is quite sharply differentiated from the secondary marginal surface, and, though greatly reduced in depth except anteriorly, is nevertheless continuous throughout uninterrupted by punctuations or furrows: in the Venterskroon specimens the two surfaces are not so sharply separated, and posteriorly the primary surface disappears altogether, the whole depth of the shield being coarsely pitted or furrowed posteriorly. The shape of the shield on the whole agrees with that of *robertsi typicus*.

This variety does not differ greatly from typical *coronatum*, and may prove to be completely connected therewith by intermediates: at present, the two seem separable in the position of the posterior ridge delimiting the upper and secondary marginal surfaces: in the shield of *robertsi*, when viewed from the side, this ridge is approximately in a line with the anterior ridge separating the dorsal and marginal surfaces: in *coronatum* the posterior ridge is on a higher level at its anterior extremity, the depth of the marginal surfaces there being greater than one-third of the transverse distance between the ridges of

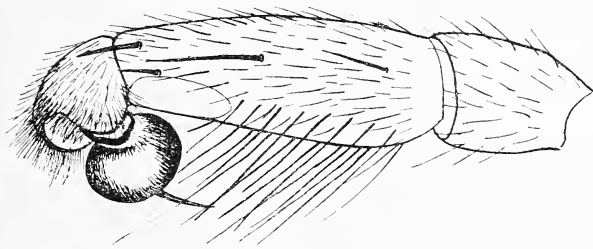
the two sides. Again, in the typical form of *coronatum*, the secondary marginal surface, characterised by much coarser and more sparsely disposed pits than the dorsal surface, completely encircles the dorsal surface, although its anterior portion is mainly distinguishable on account of the characteristic punctuations: in *robertsi* the secondary marginal surface does not completely encircle the dorsal surface, being quite unrecognisable anteriorly.

Measurements. Length of shield 10.5, breadth of shield 8, depth of marginal surface anteriorly 1.9, depth of marginal surface posteriorly 1.

Spiroctenus marleyi sp. nov. (text fig. 5).

The type of this species is a single adult male example collected at Eshowe, Zululand, by Mr H. W. Bell-Marley who kindly presented it to the Albany Museum. It is related to *spinipalpis* but can be easily distinguished therefrom through the characters of the palp and first leg: for example, metatarsus I is quite devoid of a scopula.

Legs. Tarsus IV with scopular hairs along the whole length of the segment on each side. Metatarsus I almost straight, with two spines at the apex inferiorly, three spines on the anterior surface, four on the posterior surface, and one or none mesially below, but no scopula, and metatarsi II-IV are also devoid of a scopula: II is spined much like I but there are three spines at the apex inferiorly. Tibia I with a pair of distal spur-bearing tubercles, the more



Text fig. 5. *Spiroctenus marleyi* sp. nov. Distal segments of male palp seen from mesial side.

distal tubercle with one curved and comparatively slender spur at the apex and a curved spine at the base; the other tubercle very weak, bearing a slender sigmoidly curved spur: in addition, there are three spines on the anterior surface, five on the inferior surface, one of which is apically situated, but none on the posterior surface. Tibia II with three spines at the apex inferiorly, two on the anterior surface and five on the inferior surface: III with three spines at the apex inferiorly, three or four on the anterior surface, three on the lower surface and three or four on the posterior surface. Patella I with one or two weak spines at the apex inferiorly, II with 2-0, III with a row of three short strong spines on the anterior surface and below this row there are two longer but weaker spines, IV with two spines on the anterior surface and one or two setiform spines at the apex inferiorly.

Labium and basal portions of *maxillae* armed with small elongated black cusps: there are about fourteen on the labium.

Chelicerae with eight or nine teeth in the inner row: the outer row includes six small teeth and a number of minute ones at the base of the series: the distal tooth of the outer row is in a line with the fourth from the distal end of the inner row, or the interval between fourth and fifth.

Posterior spinners with the apical segment about half as long as the penultimate segment.

Carapace as long as the metatarsus and tarsus of the first leg, and about equalling the metatarsus and one-third of the tarsus of the fourth leg.

Pedipalp. Tibia with an inferolateral row of three spines widely separated from each other, on the inner side: of these, the middle one is longest and the proximal one weakest: on the same side there is also a more dorsally situated spine near the apex of the segment. Patella with a single weak spine or strong bristle near the apex on the inner side. Femur with three strong spines superiorly near the distal end.

Colour. Appendages dull brown, carapace dark chestnut brown, abdomen infuscated superiorly.

Measurements. Total length 10.5, length of carapace 4.6, breadth of carapace 3.2, length of metatarsus of first leg 2.65, length of metatarsus of fourth leg 4.

A single female example obtained at the same time has the following characters: dentition essentially similar to that of male, the inner main row having nine or ten moderate sized teeth in a series which is interrupted in several places by an intervening minute tooth: the outer row includes 5-8 rather small teeth in a continuous series, at the base of which is a number of minute denticles, the distal tooth of the outer row being opposite to the interval between the third and fourth inner teeth counting from the apex: labium with ten cusps: maxilla with about twenty-two cusps: fovea procurved: patella III with a row of five stout spines along the anterior surface, the most basal one being very short: posterior sternal sigilla slightly more than twice their length apart: metatarsus I with two apical spines inferiorly and two along the outer side below: the two anterior pairs of tarsi are scopulate, but not densely so, and metatarsi I and II are not scopulate: apical segment of posterior spinners slightly more than half as long as the penultimate segment: the claws on all the legs have the usual double series of teeth, but the more distal row is composed of two or three very small teeth.

Colour. Carapace and appendages brown: abdomen infuscated superiorly, with numerous unarranged pale spots which break up the original dark tree pattern.

Total length 15, length of carapace 5.15.

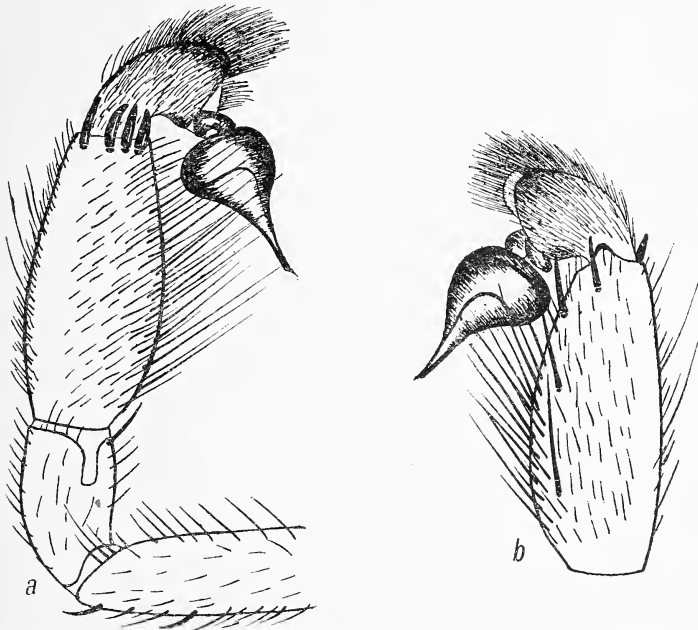
The absence of scopulae on the anterior metatarsi of the female is noteworthy, for, in females of all other species of this genus known to me, a scopula occurs on the distal portion of the first metatarsus at any rate: it is just possible that the specimen now described is immature, and that a few scopular hairs may occur in the adult female.

Spiroctenus spinipalpis sp. nov. (text fig. 6 a and b, Pl. III, fig. b).

This species is based on an adult male example from the hill above Ruby Creek, Swaziland, where it was collected by Mr A. Roberts (18. v. 1916). It can be distinguished at once from any of the described species of *Spiroctenus* through the presence of strong spines on the tibia of the palp. It is probably closely related to the Barberton species described by me under the name of *Paromostola* (?) *pardalina* (*Records Albany Museum*, II. p. 424), of which only the female is known (Pl. III, fig. a).

Legs. Tarsus IV scopulate almost to the base on each side. Metatarsus I almost straight, being only slightly bowed towards the base in side view, with two spines at the apex inferiorly, three spines on the anterior surface and four

on the posterior surface, one of them in each case being situated near the apex: it is scopulate in the distal third. Metatarsus II is similarly spined but is not scopulate, nor is there a scopula on III or IV. Tibia I with a pair of distal spur-bearing tubercles, the more distal tubercle with one curved black spur at the apex and a curved spine at its base, the other tubercle comparatively weak, its spur being sigmoidly curved: in addition, there is a row of three long spines along the anterior surface, about eight on the lower surface including one at the apex, also one on the posterior surface. Tibia II with three spines at the apex inferiorly, six on the lower surface, three on the anterior surface, but none on the posterior surface: III with three spines at the apex inferiorly, also five or six on the lower surface, two on the anterior surface and three on the posterior surface. Patella I with two spines at the apex inferiorly, II with only one spine thus situated, III with a row of three short spines on the anterior surface, IV without spines.



Text fig. 6. *Spiroctenus spinipalpis* sp. nov. *a*, Palp of adult male seen from outer side. *b*, Portion of same seen from inner side.

Labium and basal portions of the maxillae armed with numerous very minute elongated cusps. Altogether there are about thirty-six such cusps on the labium.

Chelicerae with nine teeth in the inner row, the apical one being small and the third from the base minute, or with ten teeth altogether the third and the fifth being minute: the outer row extends nearly as far as the inner row and includes eight small teeth and about six minute ones at the base of the series.

Pedipalps. At the apex of the tibia on its outer side is a row of three very stout spines: on the inner side distally there is a single fairly strong spine and a similar spine occurs more ventrally, quite near to the apex and in the same longitudinal line with two stouter bristles of the ventral tuft.

Posterior spinners with the apical segment about half of the length of the penultimate segment.

Carapace about as long as the metatarsus and three-fourths of the tarsus of the first leg, and as long as the metatarsus and one-fourth of the tarsus of the fourth leg. The deep part of the fovea has a short median posterior prolongation, being more or less T-shaped. The ocular tubercle is well marked off from the general surface of the carapace. The lateral margins of the carapace are fringed with stiff bristles which are strongest and most numerous in the posterior half. The greater portion of the carapace is glabrous but there are a few setae in the mesial region between the ocular tubercle and the fovea, and scattered stiff setae or weak bristles occur generally over the posterior portion of the carapace.

Colour. Carapace, abdomen, chelicerae and basal part of palps and legs as far as the patellae are very dark brown: patellae and more distal segments of legs and palps pale brown. The abdomen is infuscated inferiorly.

Measurements. Total length 13.2, length of carapace 5.3, breadth of carapace 4.1, length of metatarsus I 3.35, of metatarsus IV 4.8.

Spiroctenus londinensis sp. nov. (text fig. 7 a and b).

This species is based on an adult male and a series of females collected at East London by Dr Rattray and Master Rattray. The adult male was taken during August 1916: it resembles the male described by me from Pt. Alfred (*Records Albany Mus.* II. p. 467) under the name of *Spiroctenus armatus* but differs therefrom in the characters of the first leg. The female resembles those of *Bessia fossoria* Poc. and *Bessia minor* mihi, differing from the latter in the dentition of the chelicerae and from the former in the smaller number of cusps on the labium.

Legs. Tarsus IV scopulate to the base on each side. Metatarsus I slightly bowed in side view, with two spines at the apex inferiorly, one or two long stout spines on the anterior surface, also three on the posterior surface, two of the latter being situated inferiorly: it is thickly scopulate in the distal third. Metatarsus II has two spines at the apex inferiorly, one or two on the anterior surface and two inferoposteriorly: it is thickly scopulate in the distal third. Metatarsus III has several scopular hairs near the apex inferiorly but IV is quite devoid thereof. Tibia I with a pair of distal spur-bearing tubercles, the more distal tubercle with two stout flattened spurs at the apex, one of which is about twice as long as the other: the other tubercle is only slightly elevated, and bears at the apex a strong flattened spur: in addition, this segment bears a number of spines, viz. six on the lower surface including one at the apex, a row of two or three on the anterior surface but none on the posterior surface. Tibia II with three spines at the apex inferiorly, three on the lower surface, and two or three on the anterior surface but none on the posterior surface: III with three spines at the apex inferiorly, also three on the lower surface, two on the posterior surface and one or two dorsally but none on the anterior surface. Patella I with one or no spines at the apex inferiorly, II likewise, III with a single very short spine on the anterior surface, IV without spines.

Labium and basal portions of the *maxillae* armed with rather numerous minute cusps. Altogether there are thirty-eight such cusps on the labium.

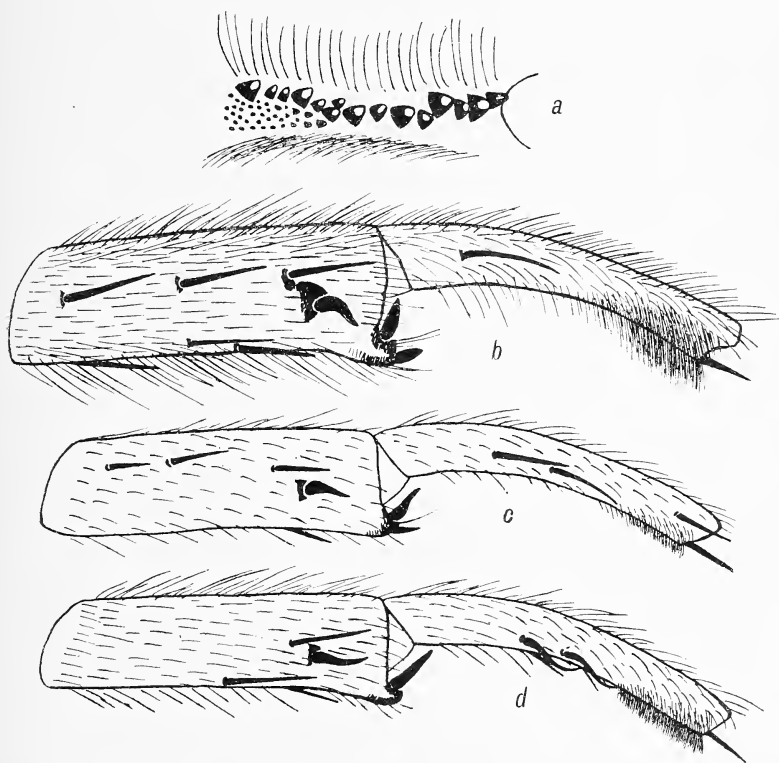
Chelicerae with about thirteen teeth in the inner row: the outer row is composed of minute teeth and extends not quite half-way along the main series.

Posterior spinners with the apical segment about three-fifths as long as the penultimate segment.

Palp. On the inner (anterior) surface of the tibia are two long but rather weak spines and many of the bristles forming the tuft on the ventral surface of this segment are spiniform.

Sternum. The second pair of sigilla is not deeply sunk in depressions.

Carapace about as long as the metatarsus and three-fifths of the tarsus of the fourth leg, and a trifle longer than the combined metatarsus and tarsus of the first leg. The deep part of the fovea is slightly procurved. The lateral margins of the carapace are fringed with bristles which are most numerous in the posterior half. The surfaces are for the most part devoid of setae but some occur in the posterior half, a few occur on the mid-line between the fovea and the ocular tubercle, others along lines radiating from the fovea and some fine hairs occur on the lateral portions of the head region.



Text fig. 7. *a*, Dentition of chelicera in female of *Spiroctenus londinensis* from East London. *b*, Tibia and metatarsus of first leg of adult male *Spiroctenus londinensis* from East London, viewed from inner side. *c*, Same in adult male *Spiroctenus minor* Hwtt. from Alicedale. *d*, Same in adult male *Spiroctenus armatus* Hwtt. from Pt. Alfred.

Colour. Carapace dark brown, chelicerae and femora of legs and palps blackish brown; the remaining segments of the legs and palps are reddish brown except the tarsi and metatarsi which are a little darker, those of the first two pairs of legs being about the same tint as the carapace. Upper surface of abdomen dull yellowish with infuscations which are somewhat indefinitely shown, being obscured by the black bristly hairs which cover the surface: in

the posterior half there is however distinct indication of thin dark cross stripes. Sternum and lower surfaces of appendages pale reddish brown: abdomen pale inferiorly.

Measurements. Total length 22, length of carapace 8, breadth of carapace 6·15, length of metatarsus I 5, of metatarsus IV 6·35.

The more important characters of the female are as follows: the inner series of teeth on the fang groove includes about fifteen large or moderate sized teeth forming a long but somewhat irregular row: the outer group includes numerous minute teeth in four or five rows, the whole group extending less than half-way along the main series: labium with about thirty-five cusps: patella III with one or two very short but stout spines on the anterior surface: fovea procurved.

The palps and legs are pale brown, becoming dark on the distal segments: the carapace is castaneous, the chelicerae blackish brown. The abdomen is infuscated superiorly, and has numerous small indistinct pale spots: ventrally it is pale.

Total length 27, length of carapace 10, breadth of carapace 7, length of fourth metatarsus 6.

I am indebted to Dr Rattray for the following information on the nests of this species. The lids of the female nests are of the same remarkable type as that described by Mr F. Cruden for *Bessia minor* (*S. African Journ. of Science*, 1916, p. 606, Pl. 28, figs. *g*, *h* and *l*). The hinge of attachment is very long and curved: there is also a well-developed hinge down the middle of the lid as if it had been made in two distinct halves which were afterwards united together. When the lid is wide open, its two halves are in the same plane: when closed down, they form an angle of about 120° with each other. The two halves of the lid are not weighted in any way, thus differing from that of *minor*. Claw and fang marks are not localised in any one spot on the lower surface. The tubular retreat is deep, passing downwards for a distance of about six or seven inches, the lower portion being free of web and lodged amongst the entangled roots of adjacent shrubs. Each nest may have two lids, as in *minor*, but more frequently has only one. The male was found in a lidless tubular retreat.

Spiroctenus curvipes sp. nov. (text fig. 8 *a-c*, Pl. III, figs. *d* and *e*).

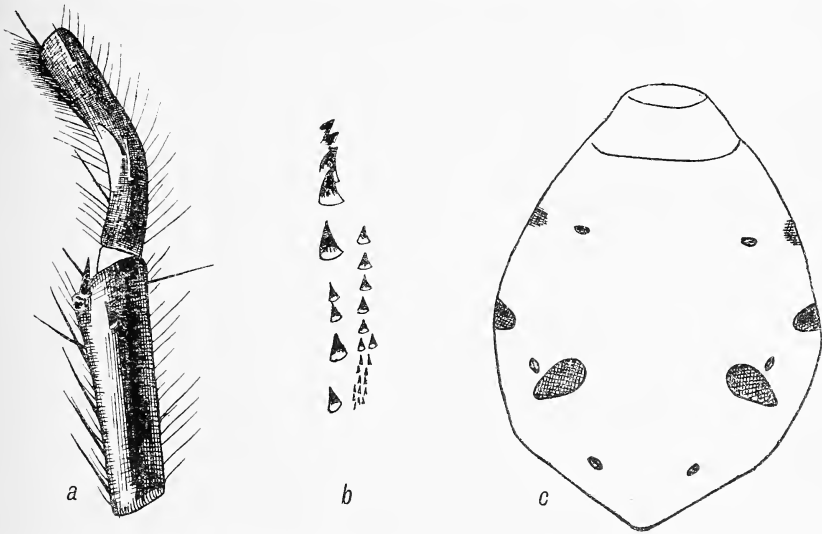
This species is founded on one adult male and a series of female examples collected at Klipspruit, Utrecht dist., by Mr J. Breyer. It is most probably nearly related to *S. personatus* Simon, from Delagoa Bay (*Actes Soc. Lin. Bordeaux*, XLII. 1888), the description of which is too incomplete for specific recognition: however, judging from Simon's reference to the colouration of the abdomen and to the characters of the metatarsus and tibia of the first leg in that species, it seems likely that the two are distinct.

The characters of the male are as follows:

Colour. Anterior portion and sides of carapace pale with a reddish tinge, hinder portion dark. Legs dark, almost black, except the coxae of the first two pairs which are reddish yellow. Inferiorly, the sternum and all the coxae are reddish yellow. Abdomen dark above with somewhat indistinct darker cross stripes broken in the middle; inferiorly pale.

Legs. The surfaces are rather thickly clothed with long hairs or bristles. Tarsus IV not scopulate. Metatarsus I rather strongly curved, with two spines at the apex inferiorly, three on the inner surface the largest and stoutest of which is situated at the bend and is itself strongly curved, also three or four

on the outer surface. Metatarsus II with two spines on the inner side, one at the apex inferiorly, one long weak one on the lower surface in the basal half and one or two on the outer surface. Metatarsus I and II only scopulate in the distal two-fifths inferiorly, III in the apical fifth or fourth, IV not at all. Tibia I with a pair of distal spur-bearing tubercles, the more distal tubercle with only one spur apically situated and without spur or spine at its base: ventrally, this segment also bears four or five long spines several of which may be rather slender. Tibia II with three spines at the apex inferiorly, four long ones on the inferior surface, one on the anterior surface, and two on the posterior surface: III with three at the apex inferiorly, also four or five on the lower surface, two on the anterior surface and four on the posterior surface, one of the latter being situated dorsally near the base of the segment and another quite near to the apex. Patellae I and II with a single spine at the apex inferiorly: III with a row of three strong spines on the anterior surface, also one weaker one on the inferior portion of that surface near the apex: IV with one or two long and very slender spines on the anterior surface.



Text fig. 8. *Spiroclenus curvipes* sp. nov. a, Tibia and metatarsus of first leg of adult male. b, Dentition of female (small specimen). c, Sternum of adult male to show the position of the sigilla and the sense organs.

Posterior spinners with the apical segment about half or three-fifths of the length of the penultimate segment.

Chelicerae with eight or nine teeth in the inner row, the three or four large teeth at the distal end of the series being crowded together and those at the base far apart, the one or two teeth in the middle of the series being much smaller than the others: there is also a shorter outer row of five small teeth.

Labium and *maxillae* muticous.

Carapace about equal in length to the metatarsus and half of the tarsus of the fourth leg, just exceeding the tarsus and metatarsus of the first leg. Fovea slightly procurved. Sides of carapace, especially posteriorly, strongly fringed with long black bristles, and the general surface except on the radial depressions is sparsely covered with short bristles posteriorly or hairs anteriorly.

Posterior sternal sigilla elongated, rather more than two diameters apart and about three-fifths of a diameter distant from the sternal margin. There is no pit-like depression on the sides of the sternum. Besides the larger sigilla of normal position, there are several pairs of small ones, all situated remote from the margin (see fig.). These are no doubt sensory structures, essentially similar to the lyriform organs that occur on the legs. The same structures occur in the males of *S. zebrina* Purcell.

Abdomen. Anteriorly, the upper surface carries a number of long black bristles and long stiff hairs backwardly directed.

Measurements. Total length 11 mm., length of carapace 4.1 mm.

The more important characters of the female are as follows: dentition of chelicerae resembling that of the male, the teeth being arranged in two rows, the larger inner row including one or two small teeth in the middle of the series, those more basally situated being rather widely separated from each other whilst the distal group includes three, four, or five teeth crowded together (see fig.); labium with 5-7 cusps, maxillae with 24-28 cusps: the tarsi of the two anterior pairs of legs are well scopulate and likewise also the metatarsi but to a less extent, the scopula of the first metatarsus stretching the whole length of the segment on one side at any rate: metatarsus I with two apical spines inferiorly and two along the outer side below: paired tarsal claws with an outer basal row of three well-developed teeth, the more distal one longest, but the inner distal row is ill-developed, being represented by three or four small teeth on tarsus I and by one small tooth or none at all on tarsus IV: patella III with a row of three (occasionally two) stout spines along the anterior surface: fovea procurved: apical segment of posterior spinners rather more than half as long as the penultimate segment. In the largest example the posterior sternal sigilla are about a diameter distant from the sternal margin and a little more than a diameter apart. The carapace and legs are pale olivaceous but on the mesial area of the cephalic region there are black hairs sparsely scattered although the cephalic portion is paler than the rest of the carapace: abdomen with dark oblique cross stripes on each side superiorly except in front where it is uniformly infuscated, but ventrally and laterally it is pale. Total length 21 mm., length of carapace 6.5 mm.

This species is at once separated from any of those described by Dr Purcell under the generic name *Hermachastes* by the dentition of the chelicerae. Unfortunately there is no reference to this character in the description of *S. personatus*. There can be little doubt, however, but that Simon's species, the genotype of *Spiroctenus*, is referable to the section which includes *Homostola zebrina* Purc. (Pl. III, fig. c), and the species just described.

The Transvaal Museum has a series of adult females with young, from Madjebesane, fourteen miles from Komati Poort, which are perhaps identical with *personatus*. In this series we find the following characters: abdomen dark, mottled with pale spots; chelicerae with two rows of teeth somewhat as in *curvipes*; labium with 5-15 cusps: posterior sternal sigilla about 1-1½ diameters apart, or appreciably more in young specimens; posterior spinners with apical segment about half as long as the middle segment; fovea procurved; patella III with a group of stout spines along the anterior surface; metatarsus I with two spines at the apex inferiorly and in addition with one or two along the lower surface on its outer side. This is very near to my *S. punctatus* (*Annals Durban Mus.* 1. p. 222) from Ngxwala Hill, N. Zululand. Recently, Mr A. Roberts has taken female examples apparently identical with the Madjebesane species at Wyldesdale, Swaziland.

Pelmatorycter breyeri sp. nov. (text fig. 9, Pl. II, fig. c).

The type of this species is an adult male collected at Klipspruit, Natal, by Mr J. W. F. Breyer. The species is closely related to my *P. nudus* (*Annals Transvaal Mus.* v. p. 192), described from Little Wonderboom, but differs therefrom chiefly in the presence of distinct scopulae on all the metatarsi, whereas in *nudus* scopulae are quite absent from metatarsi III and IV.

Pedipalp. Pressed forwards, the palp extends to a point about two-fifths of the distance along tibia I. Maxilla with a pair of denticles at the antero-basal angle inferiorly.

Chelicerae with nine teeth in the inner row.

Legs. Tarsus I with a single spine near the apex on the posterior side, II with 3-5 spines on the posterior side, III with six or seven spines on the anterior side and three or four on the posterior side, IV with about six on the anterior side and two on the posterior side. Metatarsus I with three spines at the apex inferiorly and two on the lower surface, II with three at the apex and four or five on the lower surface, IV with about eleven spines on the lower and anterior surfaces, besides those at the apex, and with two on the posterior surface. Tibia I inferiorly with three spines at the apex, seven on the inferior surface, four on the anterior surface, one of which, the basal one, being very small, and one on the posterior surface near the base. Patella III with about twenty spines on the anterior surface but only two on the dorsal surface; IV completely without spines. Tarsal claws of fourth leg with five internal (mesial) teeth and three or two external teeth. Tarsus IV broadly and densely scopulate.

The scopula of metatarsus III is only present in the apical fifth, but of IV in the distal two-fifths of the length of the segment.

Posterior spinners. Apical segment about as long as the middle segment.

Posterior sternal sigilla large, pear-shaped, hardly $1\frac{1}{2}$ diameters apart and not quite half a diameter distant from the sternal margin.

Carapace. The surface is corrugated throughout, except along the grooves and along the mesial portion anterior to the fovea.

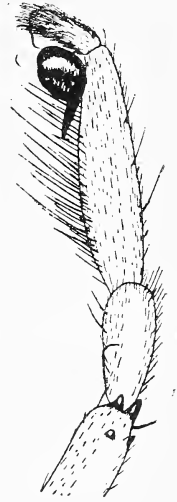
Colour. Chelicerae and carapace very dark brown, almost black: legs brown: abdomen with purplish infuscation superiorly.

Total length 13.7, length of carapace 5, breadth of carapace 3.7.

FEMALE.

A large and a small female of this species were also collected by Mr Breyer. The former has a total length of 22 mm., the carapace is 6.6 long, and 4.7 broad. Its more important characters are as follows:

Coxa III with a distinct tuft of long stiff setae on its post-ventral border: posterior sternal sigilla rather less than their length apart, and about half a length distant from the sternal margin: maxillae with three well-developed



Text fig. 9. *Pelmatorycter breyeri* sp. nov. Portion of male palp.

denticles at the anterobasal angle inferiorly: chelicerae with eight or nine teeth in the inner row, several being minute: posterior spinners with the apical segment subequal to or very slightly longer than the middle segment: abdomen elongated but not greatly so: claws of fourth tarsus with two or three teeth on each side.

The carapace is dark olivaceous, the chelicerae blackish brown, the patellae and more distal segments of the legs pale, abdomen with purplish infuscation above except for a small four-sided spot situated mesially at a point about one-fourth of its length distant from the anterior end of the abdomen.

In another specimen, also from Klipspruit, the distance between the sigilla is a trifle less than the distance between a sigillum and the sternal margin, the two sigilla being barely half a diameter apart.

Pelmatorycter tookei sp. nov.

This species is founded on five adult male examples taken at Peddie by Mr B. Marais. It is named after Mr W. M. B. Tooke, B.A., who, not long ago, arranged and identified the tick collection of the Albany Museum and rendered assistance to that institution in various other ways.

It is related to *P. nudus* mihi and *P. breijeri* sp. nov. It is easily distinguished from the latter through the weaker development of scopulae on the metatarsi, and through the stronger spinulation of metatarsus I: it differs from *nudus* in that the fourth tarsus is densely and broadly scopulate whereas there is no true scopula on tarsus IV of *nudus*.

Pedipalp. Pressed forwards, the palp extends to a point about half way along tibia I, or less. Maxilla without denticles at the anterobasal angle inferiorly. No spine at the apex of the femur anteriorly.

Chelicerae with seven or eight teeth in the inner row.

Legs. Tarsus I with 2-11 short spines inferiorly and one weaker one on the posterior side near to the apex, II without spines inferiorly and with one, two, or none on the posterior side, III with 2-6 spines on the anterior side and 0-4 on the posterior side, IV with 4-8 anteriorly and 5-12 posteriorly. Metatarsus I with three fairly long spines at the apex inferiorly and on the lower surface there is a more or less distinct double row of spines comprising altogether 8-17, the spines of the inner (anterior) row being shorter and weaker but generally more numerous than those of the outer row: II with three at the apex and 4-7 on the lower surface, also usually one on the anterior surface. Patella III with two strong spines on the upper surface and one or two weaker ones may also be present: there is also the usual group of spines on the anterior surface.

Tarsus IV rather swollen and broadly scopulate inferiorly, and all the other tarsi are scopulate. Metatarsi III and IV only feebly scopulate quite near to the apex: I and II weakly scopulate in the apical third. Tarsal claws of fourth leg with two well-developed rows of teeth, each comprising about 5-7 teeth.

Posterior sternal sigilla. About $1\frac{1}{2}$ -2 diameters apart and about half a diameter distant from the sternal margin.

Carapace. Viewed under a hand lens the surface seems uniformly smooth throughout, but not polished. Examined under a low power of a compound microscope it is seen to be minutely and densely shagreened over many isolated portions of its surface, a narrow longitudinal strip of such shagreen occurring on each side of the mesial line of the head region behind the eyes.

Posterior spinners. Terminal segment subequal to or very slightly longer than the middle segment.

Colour. Carapace and chelicerae brown, sometimes with a dull red tinge on the head region, but usually very darkly pigmented: legs brown: abdomen infuscated above and below, or somewhat paler below than above.

Measurements. Total length 11.7, length of carapace 4, breadth of carapace 3.

It may eventually seem advisable to separate generically this, and other species, characterised by the presence of horned femora in the adult male; in such case a new name will have to be framed, as there is no evidence that a horned femur occurs in either of Simon's species of *Ancylotrypa*. However, no basis for division can be discovered in the characters of the females.

Stasimopus nigellus Poc.

The Transvaal Museum has a series of four adult male and numerous female examples of this species from Venterskroon, taken March 31, 1917, by Messrs A. Roberts and G. van Dam.

The females agree closely with that described by me from Kroonstad under the name of *S. dreyeri* and are perhaps specifically identical therewith. The band of spinules on the upper surface of metatarsus I extends over scarcely more than one-fifth to about one-third of the dorsal length of the segment and is generally quite twice as long as that at the apex of the tibia. Tibia of palp with spinules apically above, but metatarsus III without spines or spiniform setae at apex below. The distance between anterior lateral and anterior median eyes is rather less than the long diameter of the former. Length of carapace 10 mm.: breadth of carapace 8.8.

The males are, I think, specifically identical with *S. nigellus* Poc. There is, however, no trace of a scopula at the apex of metatarsus I. Pressed forwards, the palp reaches about one-quarter of the distance along metatarsus I. Patella of palp only a little longer than patella I. Tarsus III may be quite devoid of spines on the anterior surface, or may have four or five weak ones. Patella III with 2-5 short spines on the anterior surface. Anterior median eyes about a diameter apart, or slightly more.

This is easily distinguished from *S. minor* mihi, a Bloemfontein species, by the measurements of the palp in comparison with those of the first leg.

Length of carapace 4.7, breadth of carapace 4.2, length of patella of palp 2.5, length of patella I 2, of tibia I 3.7.

The type example of *S. minor* has the following measurements: patella of palp 2.8, patella I 1.9, tibia I 3.1.

Stasimopus tysoni sp. nov.

This species is founded on a series of specimens collected at Port Alfred, including one adult male presented by Mr W. Tyson and some adult female examples from various donors (Misses E. and L. Britten, Mr F. Salisbury).

The male is comparatively large, agreeing in size with that of *schönlandi* Poc. from Grahamstown, and of *spinipes* mihi from East London: the female is rather small, being considerably smaller than adults of *schönlandi*. The characters of the male are not very distinctive: it agrees closely with the males of *spinipes* and of *schönlandi* in the elongation of the segments of the palps and

anterior legs: it differs from the latter in that the first metatarsus is not spined over the mesial portion of its inferior surface, as well as in the ocular characters, and from the former in the stronger development of spines on the anterior surface of patella III and possibly also the weaker spinulation of tarsus I may serve to distinguish it from *spinipes*.

The female approaches *schönlandi* rather than *spinipes* in the ocular characters, but differs from the former in the weaker development of spinules on the upper surface of metatarsus I: it differs from *spinipes* in the absence of spinules from the distal portion of the tibia of the palp.

The female also seems to present considerable points of resemblance to the Port Elizabeth species *S. castaneus* Purcell, which was based on a single female example. The relationship of these two species to each other cannot be determined until male and further adult female examples of *castaneus* are available. For the present it must suffice to separate them mainly on the ocular characters, and judging from a female example taken near to the beach at North End, Pt. Elizabeth, the band of spinules on the upper surface of metatarsus I is more strongly developed in *castaneus*, reaching one-quarter of the length of the segment.

MALE.

The keels of the carapace are very much flattened: the raised area, representing the lateral keel, is broadly and finely plicated transversely, the plicated area extending forwards to the anterior border of the carapace but posteriorly only to a point about midway between the anterior margin and the fovea. The median keel is also plicated in its anterior portion up to the region of the anterior median eyes: it is distinct throughout and posteriorly can be traced to the fovea as a faint and somewhat irregular ridge. The concavities included between these ridges are very shallow, almost obsolete.

Anterior median eyes rather less than a diameter apart, and the distance between the anterolateral and anteromedian eyes is a trifle less than the distance between the anteromedians.

Tarsus I with 4-6 spines anteriorly, and 6-7 on the posterior side. Metatarsus I without trace of scopula, and no spines over the mesial portion inferiorly. Patella III with a strip of comparatively numerous and fairly strong spines extending from base to apex on the anterior side, those near the distal edge being longest and strongest. There is a group of strong spines at the distal end of tibia III anteriorly. Anterior surface of tarsus IV with spines throughout its length, except in the basal fifth or sixth: posteriorly with eight or nine spines.

The upper surfaces of the body and appendages are black, except the distal portions of the legs and palps which are brown.

Length of carapace 7·8, breadth of carapace 7, length of patella of palp 2·85, of patella I 3·25, of tibia I 5.

FEMALE.

There are no spinules at apex of tibia of palp superiorly, and no spines nor spiniform setae (sometimes two or three bristles) at apex of metatarsus III inferiorly. The patch of spinules on the upper surface of metatarsus I extends over about one-sixth (occasionally as much as one-fifth) of the length of the segment, and this patch is rather longer than that at the apex of tibia I. On the inferior surface of metatarsus IV are usually several weak spines which are ventral members of the band on the anterior surface: these are not

constant in position and number. The ocular characters are variable: generally, the length of the anterior lateral eyes is subequal to the intervening distance between anterolateral and anteromedian, but in the largest example slightly exceeds that distance, and sometimes is a trifle less. Length of metatarsus I subequal to, or in the largest specimen appreciably exceeding, the width of the ocular area. Distance between anterior and posterior lateral eyes decidedly less than the long diameter of the former in the largest example; in most other examples they are subequal, but sometimes the anterior lateral is a little shorter than its distance from the posterior lateral.

Measurement of largest female: length of carapace 10.3, breadth of carapace 9, length of first metatarsus 3.4, breadth of ocular area 3.2.

This species will probably prove to be very limited in distribution. It is quite distinct from either of the two known to me from Grahamstown (*schönlandi* Poc., and a species doubtfully identified as *patersonae* mihi). It seems well separated from the large species *artifex* Poc. which is known only from female specimens taken in the Bathurst district at Rokeby Park and at Sea View near Kleinmond. It is different from the Peddie species, the males of which are very much smaller than that of *tysoni*. Possibly, these forms may ultimately be found to be linked together by intermediates: on the other hand, it is now certain that two related species may coexist in the same limited area, as is the case at Grahamstown, so that these various forms may really be stable entities.

Evagrus caffer Pocock var. *australis* Purcell (text fig. 10 a and b).

The species from Dunbrody described by Dr Purcell as *Thelechoris australis* now seems to be a variety of *caffer*. Since my former notes were written (*Annals Durban Mus.* vol. I. p. 132), Mr Cruden has presented to the Albany Museum a series of males from Alicedale: so far as the sexual characters are concerned, these cannot be satisfactorily separated from *caffer* as found at Durban. The characters of the Alicedale males are as follows:

Pedipalp short, when pressed forwards scarcely reaching the distal margin of patella I: bulb pyriform, passing gradually into the spine which tapers to a point at the apex where it is slightly curved, the basal part of the spine being broadly curved: tarsus short and without spines: tibia longer than the patella, expanded below and beset on all the surfaces with long curved stout bristles or setiform spines, except on each side in the proximal half and inferiorly on the outer side, three of the inferior spines on the inner side being a little stouter than the rest: long spiniform setae also occur on the upper surface of the patella, and on the distal edge inferiorly, and others on the posteroinferior edge of the femur, each arising from a minute tubercle.

Tibia II on the anteroinferior edge with a very strong, forwardly projecting, compressed, process, situated about two-fifths of the length of the segment from its distal margin, the process bearing two, three, four or five black, sharp pointed, claw-like, tubercles.

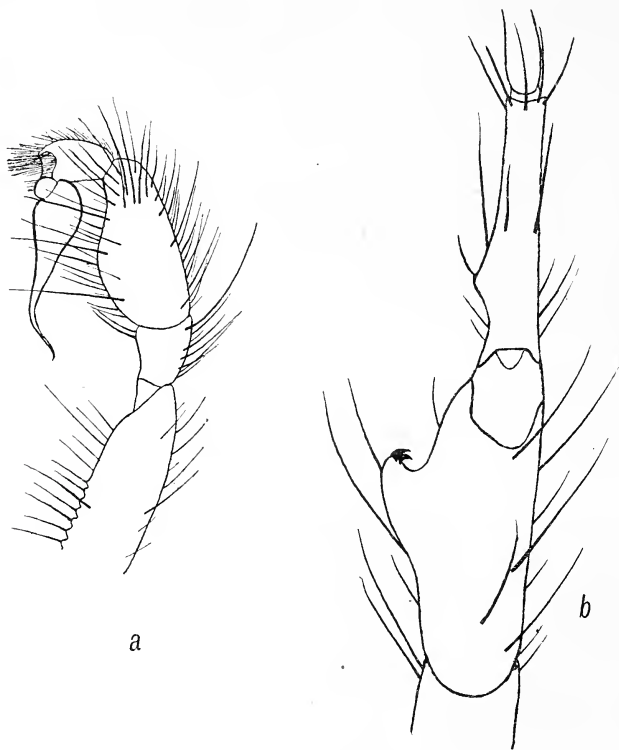
Metatarsus II with a fairly strong obtuse projection, tipped with a spine, on the ventral surface at a point about one-third of the length of the segment from its base: this segment measured on the mid-dorsal line is much longer than tibia II. Tibiae and metatarsi of all the legs armed inferiorly and at the sides with long spines. Tarsi spined at the sides and thinly scopulate below.

Dorsal surface of abdomen with numerous long, outstanding, bristly setae, as well as golden hairs, and similar stout setae occur on the legs.

The dental series of the chelicera has large and small teeth arranged more or less alternately in a well-defined row: a few minute denticles, external thereto, near the base of the series, represent the outer row.

Measurements. Total length 13.5, length of carapace 5.2, of tibia, metatarsus and tarsus of fourth leg 11.8, of tibia, metatarsus and tarsus of second leg 8, of metatarsus of second leg measured along mid-dorsal line 3.2, of tibia of second leg measured along mid-dorsal line 2.3, posterior spinners 7.6.

The characters of the male palp are very different from those of *Ischnothele* (= *Thelechoris*), which is not known to occur in S. Africa, south of the Limpopo: the male of an East African species of this genus (*I. karschi* B. and L.) has



Text fig. 10. *Evagrus australis* (Purcell). *a*, Distal portion of male palp. *b*, Tibia and metatarsus of second leg of male seen from below (note that in dorsal or lateral view the metatarsus appears much longer than the tibia).

been well figured recently by L. Berland (*Voyage de Ch. Alluaud et R. Jeannel en Afrique orientale* (1911-1912). *Résultats scientifiques. Arachnida*, III. Paris, 1914).

A species of *Ischnothele* has been described—but very imperfectly—by R. I. Pocock from Mashonaland.

Subfamily BARYCHELINAE.

Idiothele gen. nov.

This new generic name is provisionally applied to a trap-door spider which seems to be related to *Harpactivella* Purcell, and to *Brachionopus* Poc., differing

from either in the presence of well-developed feathery scopulae on the external surfaces of the chelicerae in the female. I may remark, in passing, that the two genera just mentioned seem to me identical. The genus also resembles *Pterinochilus* Pocock, differing therefrom in the shortness of the terminal segment of the posterior spinners and in the smaller area occupied by the cheliceral scopulae. Although the absence of scopulae on the chelicerae, apparently in both sexes, is a character specially emphasized by Dr Purcell in diagnosing the genus *Harpactirella*, there is just a possibility that it may eventually seem desirable to extend the definition of that genus so as to include the species now described.

The generic and even the family characters are very elusive, and I am satisfied that no useful purpose is served by maintaining the Barychelidae and Theraphosidae as distinct families. A certain amount of evidence in favour of the union of these two groups may be found in the writings of those leading authorities who have nevertheless recognised them as distinct families. Dr Purcell, in his original description of *Harpactirella*¹, referred that genus to the family Theraphosidae, but subsequently² regarded it as referable to the Barychelidae, apparently on account of the presence of a rastellum. The rastellum is however a very weak one, similar in fact to that found in species of the Theraphosid genus *Pterinochilus*, and, in any case, such a character, which varies so greatly amongst trap-door spiders and is merely an adaptation for boring into hard ground, should not be given the importance of a family distinction in my opinion.

A spider described by Mr R. I. Pocock from the neighbourhood of Grahams-town under the name of *Pterinochilus schönlandi*³, and thus referred by him to the family Theraphosidae, seems to me in all probability identical with the species from Dunbrody described by Dr Purcell under the name of *Harpactirella magna*⁴. Mr Pocock's type specimen is an adult male, now in the collection of the British Museum, and when determining the material in the Albany Museum I availed myself of the kindness of Mr S. Hirst to obtain further particulars regarding that type: according to the latter authority, the chelicera of *Pterinochilus schönlandi* has a scopula on both inner and outer surfaces, which by the generic definitions of Pocock and Purcell will exclude it from both *Pterinochilus* and *Harpactirella*. Dr Purcell's type of *H. magna* is a female, the description being exactly applicable to females in our collection which were taken along with males I now refer to *P. schönlandi*. These females on the other hand have no scopula on the inner surface and can hardly be described as scopulate on the outer surface of the chelicerae: there is however a well-developed compact patch of long silky hairs on the superior portion of that surface. In our male specimens of the same species, this patch is much denser and may rightly be described as a scopula, whilst the patch on the inner surface distally is also decidedly a scopula.

The genus now described may possibly prove to be a near ally of the Mozambique species *Leptopelma dubia* Karsch⁵: that species is however markedly different in its toothed claws.

The types of the new genus are five female specimens collected at Malelane, Barberton dist., by Mr Austin Roberts (24. vi. 1916). These I now suspect to

¹ *Trans. S. African Phil. Soc.* xi. p. 340. 1902.

² *Annals S. African Mus.* iii. p. 101. 1903.

³ *Ann. Mag. Nat. Hist.* 7. vi. p. 318. 1900.

⁴ *Annals S. African Mus.* iii. p. 102. 1903.

⁵ *Monat. König. Akad. Wiss. Berlin*, 1878 p. 314 Taf. I, fig. 1.

be referable to a species described from Barberton by Mr R. I. Pocock under the name of *Pterinochilus nigrofulvus* (*Ann. Mag. Nat. Hist.* 7. 1. p. 317): the description of that species is however very inadequate for identification purposes and, if I am right in my determination, the colour characters cited in that description are inaccurate. The determination is mainly based on the following points: locality datum, the length of the metatarsus of the fourth leg in the female, and the character of the spine of the palpal organ in the adult male.

Idiothele nigrofulvus (Pocock) (text figs. 11 and 12 a, Pl. II, fig. b).

Ocular tubercle. Subrotund, a trifle broader than long, separated from the anterior margin of the carapace by a distance equal to about one-half or even a trifle more, of the length of the tubercle. Anterior row of eyes strongly procurved. Distance between the lateral eyes equal to about two-thirds or only one-half of the length of the anterior laterals, and subequal to the length of the posterior laterals or only about two-thirds that length. Posterior medians occupying about half the area of the posterior laterals, more or less. Distance between anterior medians subequal to the diameter of a median. The posterior medians are very close to the anterior medians and to the posterior laterals, being at any rate not more than one-third of a diameter distant from the latter, nor more than half a diameter from the former: they are the smallest of the whole group, being very much smaller than the anterior medians.

Carapace. Fovea a narrow slit, transverse or very slightly procurved. Length of carapace subequal to the patella, tibia and one-third of the metatarsus of the first leg; or to the tibia, metatarsus, and almost half of the tarsus of that leg; or to the metatarsus and two-thirds of the tarsus of the fourth leg.

Legs. Tibia I with one or two apical spines inferiorly; II with two spines at the apex inferiorly; III with two and IV also with three or two spines similarly situated but a little stronger than those on I or II. Metatarsi I or II without spines; III with three at the apex inferiorly, one on the lower surface basally on the inner side, two on the anterior surface and one on the posterior surface; IV with three at the apex inferiorly and two on the ventral, anterior and posterior surfaces. The scopulae of the tarsi and metatarsi are very dense and broad, being plainly visible from above. The tarsal scopulae are all entire, that of IV having scattered black setae mesially, but the scopula is not divided thereby. Metatarsus IV is completely divided by a narrow mesial strip of setae, but all the other metatarsal scopulae are undivided: the scopulae of I and II do not reach quite to the base, that of III is absent from the basal third, of IV from the basal two-fifths of the segment. Tibia I a trifle longer than the metatarsus (measured along the mid-dorsal line) but decidedly shorter than the distance between the fovea and the ocular tubercle. Tarsal claws muticous.

Chelicerae. Inner dental series with nine or ten strong teeth: there is an outer series of minute teeth stretching rather more than half the length of the main row. Rastellum composed of long stiff setae. There is a large thick scopula on the outer surface of each chelicera the greatest depth of which is subequal to or only slightly greater than that of the naked area beneath it. There are about 5 or 6 long but weak stridulatory bristles on the outer surface most of which are situated inferiorly, near to the bristles which fringe the fang groove.

Labium with about fifty teeth in four or five irregular rows. Basal portion of maxilla with numerous teeth at the anterior corner: in the largest specimen there are between sixty and seventy, but fewer in smaller specimens.

Posterior spinners. The basal segment is only a little longer than the two terminal segments taken together, the length of which is subequal to the breadth of the ocular tubercle. The terminal segment is conical and only a trifle shorter than the penultimate segment.

Colour. Sternum, ventral portions of coxae of legs and palps, and ventral portion of abdomen black. Carapace brown, with a number of well-developed pale radiating stripes due to short appressed yellowish brown hairs (golden in the young) which also form a well-marked border to the carapace: the brown areas between the stripes are clothed with short appressed dark brown hairs. Abdomen superiorly finely mottled with indistinct small yellow spots, and bearing an ill-defined dark tree pattern: there is a pair of rather conspicuous dark blotches in the anterior portion near to the mid-line: the abdomen has a thick covering of shorter appressed hairs some of which are dark brown and others yellow, and, in addition, there is a number of long projecting stiffish yellow hairs rather sparsely distributed. The legs are pale ashy brown, being well covered with short appressed pale hairs, and in addition with some scattered longer hairs which are dark brown in their basal portion, becoming pale distally. There are no definite fringes of long hairs on the lower parts of the legs.

Measurements. Total length 40, length of carapace 13.8, breadth of carapace 11.75, breadth of ocular tubercle 2.1, length of first leg 40.5, of second leg 38.5, of third leg 37.2, of fourth leg 46, of tibia I 6.6, of tibia II 5.8, of tibia IV 7.5, of metatarsus I 6.25, of metatarsus IV 10.3.

More recently, a still larger specimen has been received from Malelane: its measurements are: carapace length 15.8, carapace breadth 12.9, distance from fovea to anterior margin of carapace 10.5, distance from fovea to hind margin of ocular tubercle 8, length of metatarsus of fourth leg 11.9. The length of metatarsus IV compared with the distance between the fovea and the anterior margin of the carapace seems to be a good character.

The proportion between the length of the carapace and that of the terminal segments of the fourth leg is not however an absolutely constant character, at any rate when the material includes specimens of different size and age. In one example, otherwise of subadult proportions, the carapace is just about equal in length to the metatarsus and tarsus of the fourth leg.

The adult male of this species is represented in the collection by a specimen from Hectorspruit (F. Streeter, 5. v. 1911). In general characters it resembles the female fairly closely. The carapace presents well-marked pale radial stripes: the hinder half of the abdomen superiorly has about five pale transverse stripes: the lower surfaces of the abdomen, coxae and sternum are infuscated but the femora and more distal segments of the legs are quite pale inferiorly.

The measurements are as follows: total length 28.5, length of carapace 11.15, breadth of carapace 9.4, distance from fovea to anterior margin of carapace 7.35, distance from fovea to posterior margin of ocular tubercle 5.7, length of tibia I 6.15, of tibia IV 7, of metatarsus I 6.30, of metatarsus IV 10.

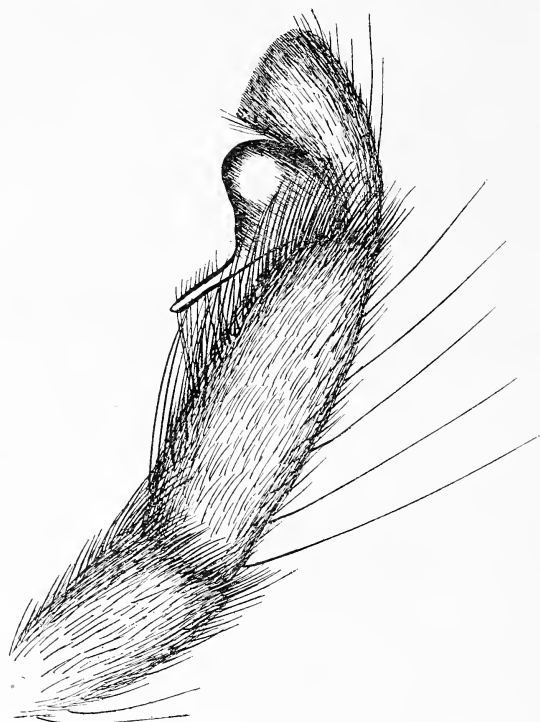
The length of the carapace is subequal to that of the tibia together with three-fourths of the metatarsus of the first leg.

The distance between the anterior median eyes is subequal to the diameter of an eye, and the distance between anterior median and anterior lateral is

decidedly less than the diameter of the anterior median. At the apex of the tibia of the palp there is a slender straight spine-bearing projection on the inner side and a spine on the outer side.

It is very probable that *Pterinochilus crassispina* Purcell, based on an adult male from the Motopo dist., Matabeleland, will prove to be referable to this genus.

The Transvaal Museum has an adult male *Idiothele* from Wolmaranstad. It agrees closely with Dr Purcell's description of *Pterinochilus crassispina*, more especially with the Vryburg specimens of that species. The more important measurements are:



Text fig. 11. *Idiothele nigrofulvus* Poc. Portion of palp of adult male.

Length of carapace 13.7, breadth of carapace 11.2, length of tibia I 6.8, length of metatarsus I 7.15, of tibia IV 7.7, of metatarsus IV 12, distance from fovea to hind margin of ocular tubercle 6.9.

The distance between the anterior median eyes is a trifle greater than the diameter of an eye and that between anterior median and anterior lateral is subequal to the diameter of the median.

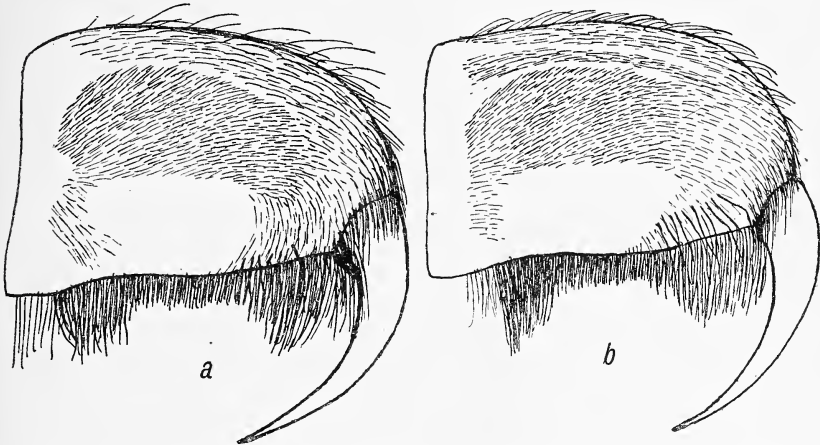
The differences between the males of this species and of *I. nigrofulvus* do not seem to be very great. The carapace is more uniformly brown in this species, and the eyes are relatively smaller, also the shape of the carapace is slightly different, that of *nigrofulvus* being broader in proportion to its length: the general proportions of the leg segments are however very similar, and the palpal organ seems much the same in the two forms. It is probable that the

Vryburg and Wolmaranstad form will prove to be distinct from the type as described by Dr Purcell from the Motopo dist., for minor differences seem to be presented in the proportions of the tibia and metatarsus of the first leg.

Nest. The females of *nigrofulvus* were found by Mr Roberts in tubular retreats provided with a well-developed trap-door. The door is very large but thin, becoming very delicate and flexible at the margin which presumably overlaps the entrance to the retreat: the shape is subcircular or more or less D-shaped. The area of a large specimen is about equal to that of a five-shilling piece.

Idiothele pluridentatum sp. nov. (text fig. 12 b).

The type of this species is a single female specimen from Nuanetsi River, Zoutpansberg dist., collected by Mr G. van Dam, 15. vii. 1916.



Text fig. 12. Outer surface of right chelicera of (a) *Idiothele nigrofulvus* (Poc.), (b) *Idiothele pluridentatum* sp. nov. to indicate the position of the scopulae and stridulatory bristles in each. (These bristles are represented as stouter than they actually are: they are very similar to the long red bristles which fringe the inferior margin of the chelicera.)

It differs from *I. nigrofulvus* in the following respects:

Ventral surfaces paler, the abdomen being devoid of infuscation inferiorly, and the coxae are only slightly infuscated, whilst the sternum is dark brown instead of black.

Carapace as long as the metatarsus and tarsus of the fourth leg.

The long stridulatory bristles on the chelicerae are rather more strongly developed, an upper series, well removed from the bristles which fringe the fang groove, being present. The cusps on the maxilla at its antero-basal corner inferiorly, are more numerous and much more compactly disposed, the whole group including rather more than a hundred cusps.

The radial markings on the carapace are not so strongly defined as there is not much differentiation between pale hairs and dark hairs, the carapace being mostly clothed with pale hairs although dark hairs do occur: these hairs are longer than those on the carapace of *nigrofulvus* and the surface has a more shaggy appearance. The ocular tubercle is rather less than half its length distant from the front margin of the carapace.

Measurements. Total length 32, length of carapace 11.6, breadth of cara-

pace 8.75, length of first leg 32, of second leg 29, of third leg 27.5, of fourth leg 34.8, of fourth metatarsus 7.4, of fourth tibia 5.6, of first metatarsus 4.8, of first tibia 4.9, distance from fovea to anterior margin of carapace 7.5, distance from fovea to hind border of ocular tubercle 6.1.

According to Mr van Dam's note, this species is also a trap-door maker, the nest being "like that of a large *Acanthodon*, the hinge of the lid 20 mm. long."

The numerous densely disposed cusps on the maxilla would appear to be the most distinctive character of the species. In this respect it differs from the Malelane specimens of *nigrofulvus* and from a Tsessebe specimen which presumably belongs to *crassispina*: in a large female from Barkly West, however, there are also numerous cusps on the maxilla but hardly so many as in the form now described. The type of *pluridentatum* is perhaps immature but the cusps on the maxilla are not likely to decrease with age.

In the Tsessebe specimen of *crassispina*, the carapace is 15.5 mm. long and the distance from the fovea to its anterior margin slightly exceeds the length of the fourth metatarsus: the Barkly West specimen, with carapace 16 mm. long, has the length of the fourth metatarsus subequal to the distance from the fovea to the anterior margin of the carapace. In both specimens the ventral surface of the abdomen is blackened like the sternum.

Pterinochilus breyeri sp. nov.

This species is founded on one large female and a half-grown specimen taken at Malelane, Barberton dist., by Mr A. Roberts, the former dated Feb. 1915, the latter 19. vi. 1916.

The smaller example is about the same size as the type female of *P. nigrofulvus* Pocock, but is clearly different therefrom in the shortness of the fourth metatarsus. The most noteworthy feature of the species is however the absence of heavy fringes of hairs on the legs: such heavy fringes are specially well developed on the lower surfaces of the tibiae of the first two pairs of legs in the large species of *Pterinochilus*¹ found in the Zoutpansberg, Waterberg and Rustenburg districts. The ventral surfaces of the sternum and coxae bear numerous long red-brown hairs projecting at right angles from the surfaces, but there is no velvet such as occurs in the Zoutpansberg species, these red-brown hairs being much more sparsely disposed than the shorter hairs which compose the velvet of the latter species. The slit of the fovea is narrow and quite shallow: at its anterior margin the surface of the carapace rises up considerably above the bottom of the fovea, but posteriorly the level of the carapace scarcely rises above the lowest part of the excavation. In the large specimen, radiating lines on the carapace are not sharply indicated for the general surface is covered with yellow hairs which occur over the interradiial regions as well as along the radii, but are not so thickly disposed in the former areas: in the small specimen the radiating lines are decidedly well developed and besides the numerous golden yellow hairs the carapace bears some whitish

¹ I presume this is the same as *P. junodi* Simon, described from the Zoutpansberg dist. (*Rev. Suisse Zool.* XII. p. 66, 1904). It may possibly be the same as *P. vorax* Poc., which, according to E. Strand, is a synonym of *P. constrictus* Gerst., the species being of very wide range in East Africa and recorded by Strand from Bulawayo, Victoria Falls and various localities in Mozambique.

For a list of the recorded species of this genus and a key to the specific characters see L. Berland in *Voyage de Ch. Alluaud et R. Jeannel en Afrique orientale* (1911-1912). *Résultats scientifiques. Arachnida*. III. Paris, 1914.

ones, mostly situated near to the fovea, and these in passing along the inter-radii become brownish. Ventrally, the black colouration occurs over the sternum, the coxae of the legs and palp, the basal portions of the first two pairs of legs as far as the basal half of the first tibia and the basal third of the second tibia and over the whole of the palp except the tarsus.

Measurements. Total length 50.5, length of carapace 20, breadth of carapace 14.25, distance from fovea to anterior margin of carapace 13, distance from fovea to posterior margin of ocular tubercle 10.1, length of metatarsus I 9, of metatarsus IV 11.75, of tibia I 9.35, of tibia IV 9, of apical segment of posterior spinners 3, of middle segment thereof 2, of basal segment 3.6, length of ocular tubercle 2.2, breadth of ocular tubercle 2.4.

There are other female specimens in the Transvaal Museum from Hector-spruit (F. Streeter).

Ceratogyrus brachycephalus sp. nov. (Pl. I, figs. a-c).

The types of this species are four female examples collected at N'jelele River, Zoutpansberg dist., by Mr G. van Dam during August 1916.

Colour. The general colour of carapace and appendages is light brown. Anteriorly, the upper surface of the abdomen is dark brown with numerous small pale spots, but more posteriorly it is pale brown with indications of thin dark cross stripes. Ventrally, the sternum and coxae of the appendages are blackish: the femora, and to a less extent the remaining segments of the first two pairs of legs and of the palp, except the scopulated segments, are deeply infuscated: the abdomen also is deeply infuscated except on the lung opercula and genital sternite.

Carapace. This is decidedly longer than the metatarsus and tarsus of the fourth leg, and much longer than the tibia and metatarsus of the first leg. No trace of pale radial stripes. The horn arising from the fovea is very large and is directed horizontally forwards, the apex being not much elevated above the level of the carapace anterior thereto: it reaches forwards to a point not far from the ocular tubercle, its distance therefrom being subequal to $\frac{1}{2}$ – $\frac{3}{4}$ of the breadth of the horn. The excavation of the fovea also extends forwards considerably, the horn being partly sunk therein and not rising freely from the carapace except slightly just at the apex (in one specimen however not even at the apex). The horn varies in size, being sometimes considerably longer than metatarsus I, at other times subequal thereto.

Legs. Tibia I very slightly longer than metatarsus I and subequal to tibia IV.

Measurements. Total length about 53 mm., length of carapace 19.5, breadth of carapace 15, length of horn 8, breadth of horn 4.5, length of tibia I 8.8, length of metatarsus I 8.2, of metatarsus IV 11, of tibia IV 8.8, length of apical segment of posterior spinners 3.2, breadth of ocular tubercle 2.15. In another specimen with carapace 18.8 mm. long, the horn measures 7.2×4.35 : a third example with carapace 18.5 mm. long has a horn measuring 9.3×4.4 .

The Albany Museum has specimens of this form from Tsessebe (E. C. Wilmot), and it is noteworthy that another species was taken in the same neighbourhood by Mr Wilmot: this latter seems very near to *C. darlingi* Pocock, described from Enkeldoorn, a locality 110 miles S. of Salisbury (*Proc. Zool. Soc.* 1897, p. 754, Pl. XLII, fig. 5 and Pl. XLIII, figs. 1–1 a).

Ceratogyrus dolichocephalus sp. nov. (Pl. I, fig. *d* and Pl. II, fig. *a*).

The types are two female specimens from Victoria, S. Rhodesia, collected by Miss S. E. A. Ambrose and Master R. H. Ambrose.

Colour. The general colour of body and appendages dorsally is brown. The long hairs have a rufous tinge: this is very marked on the upper surface of the abdomen in its hinder half. The carapace has conspicuous thin pale radial stripes. Ventrally, the sternum and coxae of legs and palps are blackish brown: the femora of the first two pairs of legs and of the palps are also very dark, the patellae and tibiae being brown. The ventral surface of the abdomen, including the lung opercula, is dark brown but the genital sternite is yellow.

Carapace longer than the tibia and metatarsus of the first leg and subequal to the tibia and metatarsus of the fourth leg. The horn of the fovea is not separated off from the rest of the carapace by a continuous groove all round its base, for the limiting groove is U-shaped, and the horn thus appears to be a backward extension of the head region: the head region from the ocular tubercle to the horn is fairly well raised from the rest of the carapace, and in side view the outline of this region is practically a straight line from the hind margin of the ocular tubercle to the end of the horn, the latter being only a trifle raised above that line. The apex of the horn is obtuse, and posteriorly descends suddenly so that the horn presents practically no free ventral portion.

Legs. The tibia of the first leg is decidedly longer than the metatarsus of that leg, and just a trifle longer than the tibia of the fourth leg.

Measurements. Length of carapace 20·9, breadth of carapace 16·1, distance from anterior margin of carapace to apex of the foveal horn 16·8, distance from anterior margin of carapace to the U-shaped groove margining the tubercle 12·5, distance from base of tubercle to hind margin of the carapace, measured along the median line 3·9, length of tibia I 10, of tibia IV 9·6, of metatarsus I 9, of metatarsus IV 11·5, breadth of foveal horn 4, length of apical segment of posterior spinners 3·1, breadth of ocular tubercle 2·65.

The Albany Museum has a specimen of this form from Salisbury, collected by Mr C. von Hirschberg.

The species is of particular interest as it seems to be primitive with regard to the characters of the foveal horn, and connects the more typical species of *Ceratogyrus* with those of *Pterinochilus*. It clearly points to the conclusion that the genus *Ceratogyrus* originated from a *Pterinochilus*-like ancestor which had a strongly procurved fovea. The characters of a male, which presumably belongs to this species, afford almost convincing evidence of this, for the adult male is quite devoid of a tubercle as such, this organ being represented by the undifferentiated portion of the cephalothorax which is included within the U-shaped groove of the strongly procurved fovea.

MALE.

Mr C. von Hirschberg has collected what seems to be the male of this species at Salisbury. But for the fact that it was taken in the same neighbourhood as a large female of *dolichocephalus*, I would have hesitated to refer it to this species or even to the genus *Ceratogyrus*. However, it may prove to be identical with *C. marshalli* Pocock, also taken at Salisbury (*Proc. Zool. Soc.* 1897, p. 754, Pl. XLIII, figs. 2-2 *b*), but according to Pocock's description and figure that species has a distinct, but small, foveal tubercle.

Our Salisbury male has the following measurements: total length 35.75, length of carapace 14.5, greatest breadth of carapace 11.5, breadth of carapace anteriorly 5.25, distance from anterior margin of carapace to posterior end of "tubercle" 9.4, breadth of U-shaped groove of fovea, measured anteriorly 2.15, length of tibia I 9.1, of tibia IV 8.5, of metatarsus I 8.7, of metatarsus IV 11, of apical segment of posterior spinners 2.25. The length of the fourth metatarsus thus very decidedly exceeds the distance from the anterior margin of the carapace to the end of the foveal tubercle: such is not the case in the Umtali male, where in fact the distance from the anterior margin to the tip of the tubercle slightly exceeds the length of the fourth metatarsus.

The carapace is unfortunately too rubbed for description of the hair covering: apparently, pale radial stripes were present. The upper surfaces of body and appendages are more or less ashy brown, the distal margins of the segments of the legs and palps from the femora onwards being fringed with white hairs. The upper surfaces are nowhere rufous or ferruginous. Apparently, nothing very distinctive is found in the palpal characters nor in those of the first leg. It may be noted that the process at the apex of tibia I is strongly curved outwards, and the spine it bears is also curved. The spine of the bulbal organ is moderately long, curved, and drawn out suddenly to a point at the apex.

The narrowness of the carapace anteriorly will perhaps prove to be distinctive of the species: in the specimen now described the carapace is compressed laterally in its anterior portions, whereas in males of other species it seems to be more depressed.

Family ZODARIIDAE.

Diores godfreyi sp. nov. (text fig. 13 a-c).

The type is a single adult female example taken at Somerville C. P. by the Rev. R. Godfrey who writes of it: "the spider was found inside a nest built exactly after the pattern of a false scorpion's, a nest of small pieces of grit lying hemispherically on a stone with a slender silken lining on the inside of the hemisphere and on the enclosed surface of the stone." Similar nests have been found by Mr F. Cruden at Alicedale, the species of that locality being referable apparently to *D. bivittatus* Simon. The Somerville species differs from *bivittatus* in the following characters: size, colour pattern, and form of epigyne.

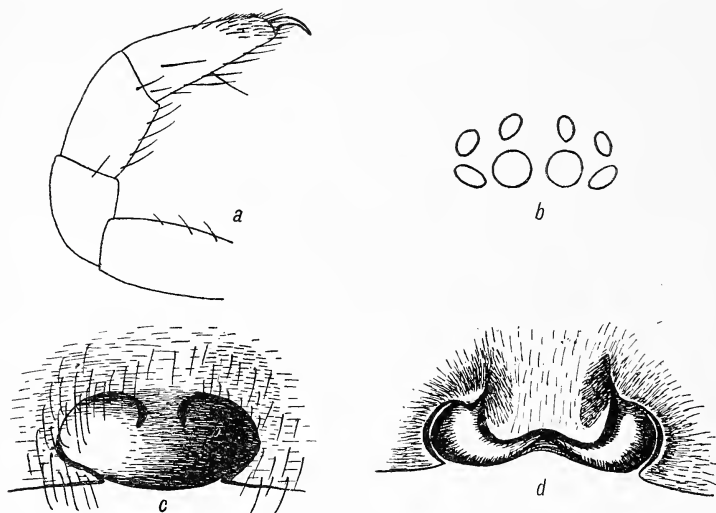
Colour. The abdomen superiorly is dark purplish, and its posterior half has five short transverse pale stripes which are restricted to the mesial region: the most anterior stripe is chevron-shaped and the second one is distinctly bowed in the middle: posteriorly, in the neighbourhood of the vent, is a pale patch formed by fusion of several posterior stripes. Lower surfaces of abdomen whitish. Carapace and legs straw coloured.

Ocular area very similar to that of *bivittatus* but the anterior median eyes are not quite so large as in that species: the distance between the anterior medians is $\frac{1}{3}$ — $\frac{2}{3}$ of the diameter of an eye, whereas in *bivittatus* it is about one-quarter of a diameter.

Pedipalp. There are no distinct spines on the palp but spiniform setae occur on the tarsus, two of which are rather stronger than the rest. The claw is longer and stronger than that figured by Simon for *bivittatus*, or than in Alicedale specimens which I refer to that species.

Epigyne. There is a mesial dark brown glabrous area considerably broader than long, with strongly curved surface. There is no pocket or depression on this surface, except in the pair of minute, backwardly directed, deeply pigmented clefts which form the anterior termination of the furrows that constitute the lateral boundaries of the area. The epigyne of the Alicedale species has a deep and broad mesial pouch, separated from the genital opening by a narrow raised bridge which connects the convexities of the two sides.

Measurements. Total length 3.75, length of carapace 1.65, breadth of carapace 1.1.



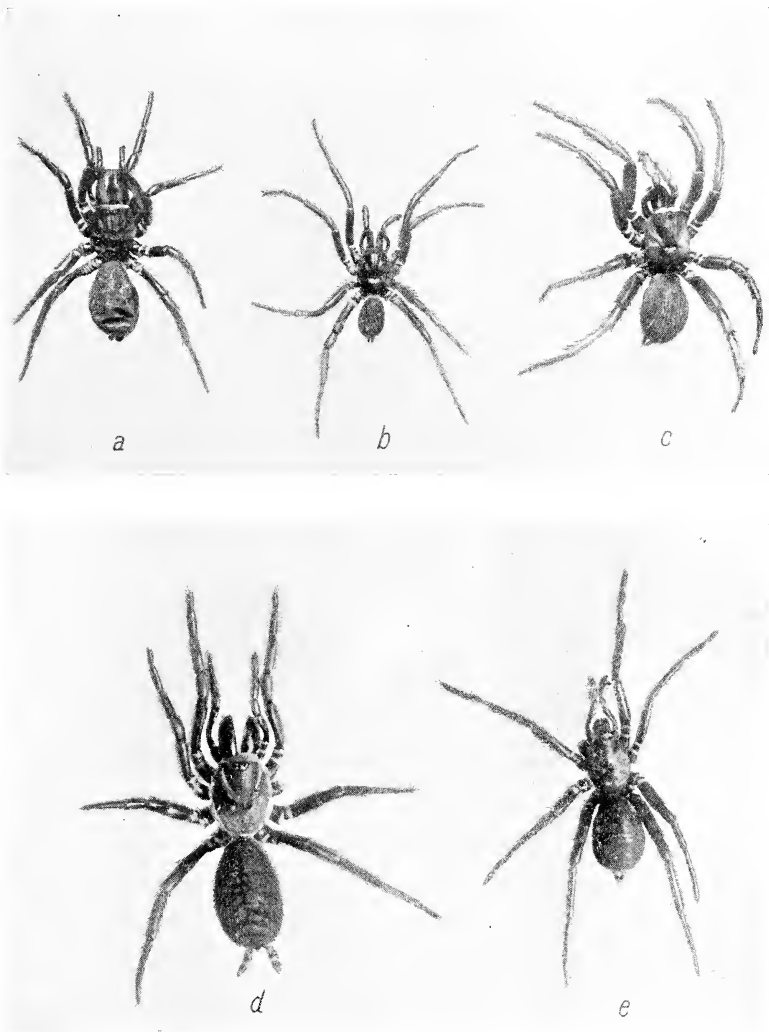
Text fig. 13. *a*, *Diores godfreyi* sp. nov. Palp of female. *b*, Eyes of same. *c*, Epigyne of same. *d*, Epigyne of *Diores bivittatus* Sim. from Alicedale.

Mr E. Simon described several species of this genus, and gave a key to the characters of the seven species then known, in his account of the spiders collected by Dr L. Schultz in S.W. Africa (*Denkschr. med. nat. Ges. zu Jena*, XVI. p. 185, 1910).

D. godfreyi seems to belong to the group of *triangulifer* from Damaraland, *transvaalicus* from Hamman's Kraal, and *vittipes* from Stellenbosch, species only known to me from Simon's descriptions. In these species, as in *vittatus*, the six hinder patellae are armed with spinules superiorly, but in *godfreyi* no spinules occur: instead, there are rather numerous short, more or less spiniform setae. The third patella of *vittatus* from Alicedale has a number of similar stout setae and in addition about twenty short strong spinules.

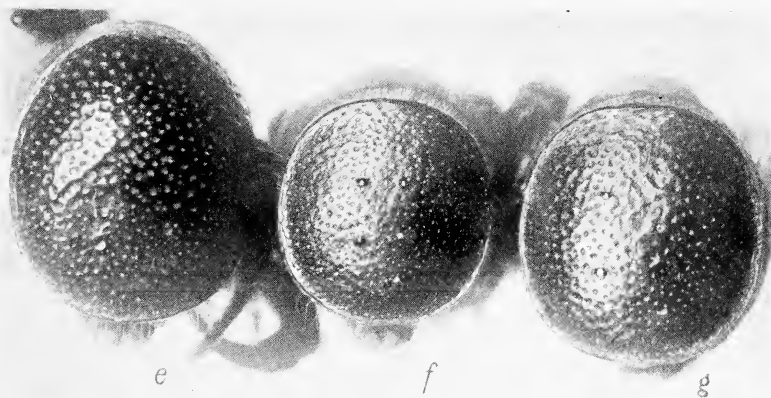
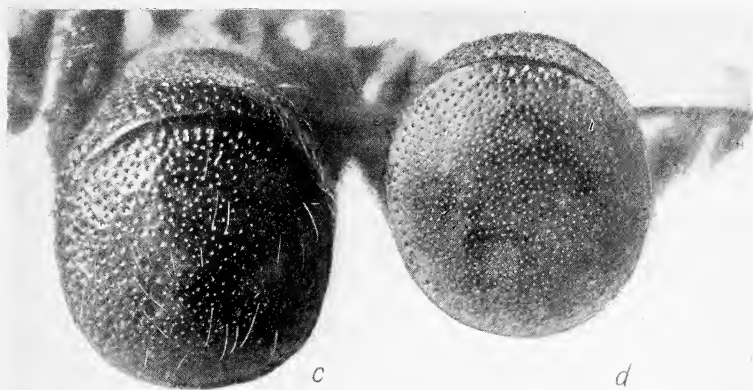
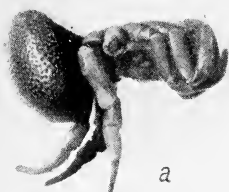


a-c. Three females of *Ceratogyrus brachycephalus* sp. nov., from N'jelele River.
d. Female of *Ceratogyrus dolichocephalus* sp. nov. from Victoria.



a. Female of *Spiroctenus pardalina* (Hwtt.) from Wyldesdale.
b. Male of *Spiroctenus spinipalpis* sp. nov. from Ruby Creek hill.
c. Male of *Spiroctenus zebra* (Purcell) from Ruby Creek.
d and e. *Spiroctenus curvipes* ♀ and ♂.





a. *Galeosoma coronatum spherioideum*.

b. *Galeosoma robertsi crinitum*.

c. Shield of *Galeosoma schreineri* (Hwtt.) from De Aar, in face view. Enlarged.

d. Shield of *Galeosoma pluripunctatum* sp. nov., from Mooi Vley.

e. Shield of *Galeosoma vandami* (Hwtt.) from Griffin Mine.

f and g. Shields of *Galeosoma vandami circumjunctum* var. nov. from N'Wanedzi River.

ADDENDUM I

Acanthodon flaveolum Poc.

The adult male of the typical form of *flaveolum* was taken recently in Grahamstown by Mr J. van Dam (15. ix. 1918). Frontal eyes about $\frac{1}{5}$ of a diameter apart, the anterior ocular quadrangle wider behind than in front, the ocular area approximately $\frac{1}{3}$ as long as the distance from the anterior margin of the carapace to the fovea. All the tarsi scopulate: tarsus I with a spine on each side. Metatarsus I only very slightly longer than tibia I, and only slightly curved near the base, but without distinct incrassation at any point: on the inner surface of the segment there are no distinct bristles, but stiffish hairs occur, and towards the apex are two long spines. Excavation of tibia of palp with a continuous semicircular group of spinules or short spines, the basal portion being best developed: altogether, there are about thirty such spinules. Carapace 4 mm. long.

ADDENDUM II

Spiroctenus londinensis sp. nov.

I have recently received specimens of a closely related species from Hogsback, Amatola Mts., also collected by Dr G. Rattray. These are presumably referable to *Hermachastes flavopunctatus* Purc. (*Annals S. Af. Mus.* III. p. 98, 1903). The species is evidently a member of the Bessia group. Its dentition resembles that of *londinensis*. There is an inner row of about thirteen teeth arranged along a curved line, and a basal group of very minute teeth on the outer side. Patella III has usually three spines on the anterior surface, sometimes four, or even only two: immature specimens of *londinensis* may also have three spines on this segment. The Hogsback females are considerably smaller than adults from East London, the carapace being only 6.4 mm. long: in a specimen of similar size from East London the hairs of the abdominal surfaces are much longer and stronger than in *flavopunctatus*, but otherwise the two seem much alike.

ADDENDUM III

(With 1 text figure.)

IN reply to Mr Tucker's criticisms¹ of my statements and conclusions on spider systematics:

p. 79. He is correct in objecting to the association of *Moggridgea seticoxa*, *coegensis* and *nigra* under the heading "Coxa II with a distinct posterobasal group of shorter and more densely crowded (often spiniform) setae inferiorly." The original MS read Coxa III (not II). The alteration was made by the printer. I may add that the whole paper (in *Annals Transvaal Mus.* vol. v. no. 2) is stultified by numerous quite palpable printer's errors, no proofs having been submitted to the writer.

¹ "On some South African Aviculariidae (Arachnida). Families Migidae, Ctenizidae, Diplotheleae and Dipluridae." By R. W. E. Tucker, B.A., in *Annals S. African Mus.* vol. xvii. pp. 79-138. It is an important paper, and well illustrated. In quoting from that paper the italics are mine.

pp. 84-87. In passing, it may be noted that Mr Tucker's descriptions of the two new species of *Stasimopus*, based on adult males, should be supplemented by comparative or absolute measurements of the palpal segments and of the segments of the first leg. Such data are of primary importance.

p. 97. Under the heading of *Homostola zebrina* Purcell, Mr Tucker says: "This species has been included by Hewitt as a synonym of *Spiroctenus*"; but—"it seems fairly clear that Purcell's *zebrina* is rightly referred to the genus *Homostola*, and further that it is not synonymous with *Spiroctenus*." In a further note on p. 136, in reference to my later work on *Spiroctenus* (*Homostola*) *zebrina*, he adds: "I have examined Hewitt's specimens both male and female and consider them to be true *Homostola* sp. *zebrina* and can hardly agree that they are *Spiroctenidae* though the two genera have much in common."

Now firstly, although Mr Tucker speaks with confidence regarding the actual identity of the genus *Homostola* Simon, yet there is considerable uncertainty on the matter: I have never seen any specimen agreeing with the description of the genotype *H. vulpecula*, nor had Dr Purcell when he described *zebrina*: certainly, Simon's description of the generic characters "Ungues postici serie unica dentium 6-7 inaequalium armati" and "metatarsi antici... parce et minutissimi aculeati" does not readily admit of the inclusion of *zebrina* therein.

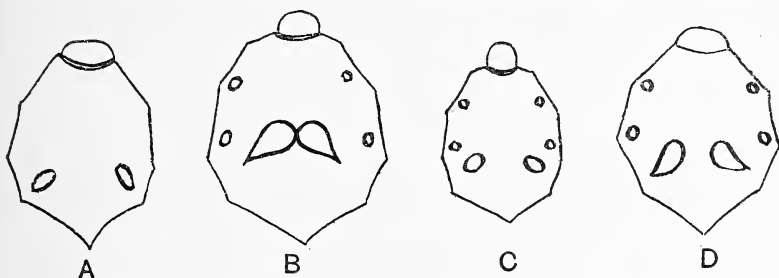
As regards the relation between *H. zebrina* Purcell and the genus *Spiroctenus*, Mr Tucker's remarks are truly ambiguous: he admits that "the genera have much in common," yet alluding to actual specimens of *zebrina* that I lent him, "can hardly agree that they are *Spiroctenidae*." What does this mean?

The chief point at issue is the taxonomic value of the sternal sigilla. In Simon's great work, the *Histoire Naturelle des Araignées*, this character was utilised in separating large groups of genera from each other, and later workers still seem to regard the character with favour. On the other hand, I am convinced that its value in classification has been greatly over-rated. The size and position of the posterior sigilla varies considerably during the lifetime of the same individual in various species of *Pelmatorycter*: the genera *Pelmatorycter* and *Ancylotrypa* as redefined by Mr Tucker, represent the opposite extremes of sigilla variation, yet are completely linked up by intermediate forms, and the relationship existing between extreme types is borne out by a study of the nests they construct. (See account of nests of *Pelmatorycter crudeni* and *P. parvus*—which latter would be called *Ancylotrypa* by Mr Tucker—in *S. Afr. Journal of Science*, 1916, July.)

My views will be understood from the accompanying figure, which is an exact copy of that published in Mr Tucker's paper and used by him to emphasize the essential difference between *Pelmatorycter* and *Ancylotrypa*. The figures A—D represent the sterna with sigilla of the males of four distinct species. A and C are referred by Mr Tucker to the genus *Ancylotrypa*: this well illustrates the fact that the *number* of sigilla does not signify, as a generic character. B and D are referred by Mr Tucker to the genus *Pelmatorycter*: these considered either alone, or in conjunction with A and C, show that *position* of sigilla is also of little value. There remains only to be considered the *shape* of the posterior sigilla, for it happens that both species chosen to represent *Pelmatorycter* have sigilla with pointed tails: however, his description of that genus commences "Posterior sternal sigilla large, oval or pear-shaped, and median to submedian in position." As regards actual size, the character is too variable to be admitted as a basis for generic separation. It

should be added that Mr Tucker has evidently recognized these facts, for in writing under the heading "Systematic value of sternal sigilla" he says of these genera: "In specimens of both genera available for examination great similarity exists, and the posterior sternal sigilla show less divergence than in other genera discussed."

It is possible that the species I have hitherto grouped together into the large genera *Acanthodon*, *Spiroctenus*, and *Pelmatorycter*, may be capable of segregation into natural groups, for which the establishment of generic or subgeneric names will be merely a matter for individual opinion: but I doubt if such division can be made solely on female characters. The secondary sexual characters of adult males may furnish a more solid basis for such subdivision. Some of the species included by Mr Tucker in the genus *Ancylotrypa* have a striking character in the horny processes of the male palps, but other species of that "genus" are completely devoid of such processes. As pointed out in my accompanying paper, characters of considerable constancy throughout whole groups of species are found in the tibial tubercles



of the first leg of male *Acanthodons*. Still, as an index of affinity, secondary sexual characters are apt to prove erratic, and for this reason I regard them for the most part as of subgeneric value only.

p. 112. Mr Tucker, after remarking that a number of female specimens from Stellenbosch strongly resemble *Hermacha nigra* and are apparently closely allied to it, adds: "it is no doubt a young example of this species which was described by Simon as *Damarchodes purcelli*" and then says "Damarchodes is considered by Purcell to be synonymous with *Hermacha*: Hewitt however thinks it allied to *Pelmatorycter*." What I actually wrote was: "Damarchodes is founded on a Stellenbosch species which is not known to me: many of its characters, according to the description, would seem to ally it with *Pelmatorycter* yet it must differ therefrom, apparently, in that the claws of the anterior tarsi are armed with a single series of teeth and the cephalothorax is crebre sericeo-pubescent."

p. 119. In dealing with the problematical genus *Thelechoris*, Mr Tucker places together specimens from Durban, Grahamstown and Cookhouse under the name of *Thelechoris australis* Purcell, the type of which came from Dunbrody: now the Durban specimens, as pointed out by me some years ago (*Annals Durban Mus.* vol. 1. p. 132), are identical with the species *Evagrus caffer* Pocock, and a new generic name may have to be created for the species.

p. 126. In a somewhat lengthy historical account of the vicissitudes of the names *Idiops* and *Acanthodon*, Mr Tucker complains that I still make use of the latter name. He thinks it should now be abandoned.

It is true that M. Simon in the appendix to his great work has placed the two names as synonymous because the ocular characters have no generic

value, and that, so long ago as 1870, Mr O. P. Cambridge made the same suggestion, but in both instances the accompanying propositions are so obviously untenable that one may reasonably hesitate to accept their view on this point: and indeed, Mr Tucker himself rejects the simultaneous proposal of M. Simon to restrict the use of the generic name Idiops to the tropical American species. Idiops and Acanthodon were not founded on specimens of the same sex; there seems to be no evidence that they came from the same part of Brazil—a rather large country—and though apparently only two Idiopine genera are recorded from that part of the world it is very probable that more do occur. Petrunkevitch in his recent *Index Catalogue of American Spiders* remarks thus: “especially the tropical countries of Central and South America will yield for a long time to come an inexhaustible amount of new forms.” Less than a generation ago, only one Idiopine genus was recorded from S. Africa: since then, half-a-dozen genera have been recognized, all founded on characters of female specimens. It is important to note that amongst Idiopine spiders the females afford better generic characters than males, and that males of related genera, being more generalized than females (except as regards purely sexual characters), are very easily confused together, in spite of the fact that in specific differentiation the males provide more tangible characters: to illustrate this, I need only mention that males of Galeosoma are almost completely devoid of the one character which so markedly distinguishes the genus, and thus are very like males of Acanthodon. It seems to me therefore that the identity of Idiops with Acanthodon should be regarded as *sub judice*.

Again, I have previously explained in what sense I employed these terms Idiops and Acanthodon (*Annals Durban Mus.* i. p. 225): in thus limiting the generic groups, I have merely followed Dr Purcell (*Trans. S. Afr. Phil. Soc.* xv. p. 118), but on ascertaining that S. African females referable to the genus Ctenolophus are generically identical with the type of Acanthodon, I have not hesitated to abandon the name Ctenolophus in favour of Acanthodon. Assuming the correctness of Mr Tucker's statement in the following extract from his account, it would seem that Idiops and Acanthodon may each be maintained in their original sense with propriety: “It may be mentioned that *Ctenolophus* and *Idiops* differ in one respect, namely, the latter has two rows of teeth on the cheliceral groove whilst the outer row is represented in *Ctenolophus* by minute denticles only: this by itself is perhaps hardly sufficient for separation, though fairly constant, but would no doubt serve to divide the group into two main classes.”

On this, I may remark that all we require of a character for generic purposes is *constancy*: a small character is more important than a large one, if it is more constant.

As a matter of fact, this dentition character presents intermediates between the Ctenolophus type and that to which the term Idiops was restricted by Dr Purcell. When but few species were known, it was easy enough to limit such groups as Ctenolophus, Idiops, and Gorgyrella, but the more we increase our knowledge of the fauna, the more we realise the impossibility of drawing sharp lines between the genera. However, as a matter of convenience it seems better to retain the names Acanthodon and Idiops (or alternative names), either as genera or as subgenera: for the two groups have some geographical significance. Various species of Acanthodon are known from the Cape Province, but not a single Idiops: on the other hand, the Indian species seem to be true Idiops (cp. *I. biharicus* Gravely).

Mr Tucker's proposal to establish a new genus, *Segregara*, on those *Acanthodons* (excluding *Gorgyrella*) which have three pairs of sigilla, only adds to the difficulties of systematists, and is open to the still more serious objection that it conveys an impression of discontinuity which actually does not exist. I am quite satisfied that in a natural system of classification the species which "are distinct in the possession of 3 pairs of small marginal sigilla" should not be generically separated from those otherwise similar species which have only two such pairs. *Acanthodon microps* usually has two pairs of sigilla, but occasionally has three pairs. The very first species mentioned by Mr Tucker as referable to his genus *Idiops*, as thus restricted, will witness against the advantage of basing genera on meristic variations—the trisigillate form is primitive—of this kind, for I have a specimen of *spiricola* which on one side presents three sigilla, but on the other side only two.

It is admitted however that the position of sigilla relative to the margin of the sternum is of rather more importance, and thus the genus *Gorgyrella* has better claims for recognition. Still, a study of the Transvaal species has convinced me of the impossibility of separating genera on this character. There seems to me no justification for generically separating *Acanthodon transvaalensis* from *schreineri* as proposed by Mr Tucker. My conclusions are also supported by habitudinal characters. There is a small Transvaal form of *Gorgyrella* which I can only recognize as a variety (*minor*) of *schreineri*¹: only recently have I learnt, from Mr G. van Dam, that this spider has a remarkable type of lid, closely resembling that of *abrahami*² (the type of *Segregara*). We know that considerable differences are found amongst the lids of the different members of a genus, but it seems most improbable that species which agree together in making a lid so characteristic as that of *abrahami* can belong to different genera.

Lastly, Mr Tucker's speculations on the generic migrations and origins of the *Idiopeae* are by no means convincing. He says: "Now Pocock, writing on the geographical distribution of the *Tenizidae* (*P.Z.S.* 1903) considers that *Idiops* reached South America, not from N. America but from Africa. This and the general geographical distribution of the *Idiopeae* indicate that *Tropical Africa* was the seat of origin of the group." And again: "Finally, *Gorgyrella* can also be regarded as an off-shoot from form (A) and it is important in that it lends support to the theory of the South African origin of the *Idiopeae* in that it is found in S. Africa alone." This interpretation of the great diversity of form that obtains in Southern Africa may happen to be actually correct, but is certainly not adequately supported by facts. The *Idiopine* fauna in most parts of its extensive range through the warmer parts of the world has scarcely been touched, and we know absolutely nothing whatever of its geological history. To-day, Africa is the headquarters of Antelopes, yet H. F. Osborn tells us "it is probable that the Antelopes together with the entire stock of *Cavicornia*, including the *Bovinae*, or cattle, originated in Asia." (See his *Age of Mammals*.)

The apparent absence of *Idiopine* genera from the south-west parts of the Cape, and from Madagascar, will probably be more generally interpreted as signifying the comparatively recent arrival of this group in Africa.

Any attempt to correlate the evolution of the group as a whole with the known facts of distribution must be of very doubtful value, so long as the available data are so very imperfect.

¹ See G. van Dam and A. Roberts in *Annals Transvaal Mus.* vol. v, p. 223.

² See F. Cruden in *S. Afr. Journal of Science*, July 1916.

DESCRIPTIONS OF SOME NEW MAMMALS

By AUSTIN ROBERTS

DURING last year a large number of mammal specimens were added to the Transvaal Museum collection, amongst which are a few apparently not yet described. Besides these, the following rare species were secured:

Myotis tricolor (Temminck) at Venterskroon, Potchefstroom, collected by Museum staff.

Cloeotis percivali Thomas. Pretoria, collected by Museum staff.

Rhinolophus darlingi Andersson. Pretoria, Museum staff.

Rhinolophus geoffroyi A. Smith (*Zool. Journ.* iv. p. 433, 1829), Lormarins (Paarl), and Klaver, C. P., taken by Museum staff. This name apparently takes precedence over that of *Rhinolophus augur* Andersson (*Ann. and Mag. N.H.* ser. 7, vol. xiv. p. 380, 1904), by which it has been commonly known since the date of its description.

Crocidura cyanea Duvernoy. Lamberts Bay, C. P., taken by Museum staff.

Viverra civetta Schreber. Rustenburg District, taken by W. Powell, and low veld of Zoutpansberg District, taken by Museum staff.

Mungos grandis (Thomas). Rustenburg District, taken by W. Powell.

Heliosciurus flavivittus (Peters). Myiai, 40 miles south-east of Daressalaam, E. Africa. This species was quite common at this place, where *Paraxerus cepapi* (A. Smith) was also quite common, and a specimen, of which the skull was unfortunately lost, was also obtained. *H. flavivittus* was very readily distinguishable in life by the broad white lateral stripe.

Epimys namaquensis grahami mihi. Lormarins (Paarl), Klaver, and Lamberts Bay. This species was originally described from Namaqualand, and it is therefore surprising to find the larger subspecies recently described from Grahamstown occurring so far west. It was rare at all these localities.

Cistugo lesueuri sp. nov.

This genus was first described by Thomas (*Ann. and Mag. N.H.* ser. 8, vol. x. pp. 204-206, 1907) on a single specimen taken in Angola. Apparently no more specimens have since been collected, and it is therefore pleasing to be able to record yet another specimen from so far south, and apparently representing another species. The present one differs most markedly from *Cistugo seabrae* in size, the cranial and external characters seemingly differing but little; there appear to be no glands on the wing, however, and the colouration is somewhat different, both of which may eventually prove to be of little importance. *C. seabrae* is described as: "General colour dull drab, the bases of the hairs everywhere slaty, the tips above drab, below whitish. Membranes brown, with whitish edges, the light-coloured reticulations conspicuous." In the present species, the base of the hair is black, the upper parts as far as the crown terminally "honey-yellow" (Ridgway, 1912), the under parts as far as the chin much paler, yellowish white. The top of the head shows less of the yellowish colour and merges into the dark brown which characterises the face. Hair on the edge of the wing membrane merging from

the yellow of the back to brown externally. Ears and nose almost naked, the former more thickly haired at the base posteriorly. The specimen being a dried skin cannot be accurately described as regards the ears; but apparently the tragus is almost straight on its inner margin, the outer margin convex. In the teeth, which are worn, the inner anterior cusp of P⁴ is in line between the same cusps of P³ and M¹.

The following comparative measurements will serve to show the difference in size:

	<i>Cistugo seabrae</i>	<i>Cistugo lesueuri</i>
Head and body	40	47
Tail	40	43
Tibia and hind foot (c.u.)	18.2	19.5
Ear	12	13
Skull: greatest length	13.2	14
Brain case	6.6	7
Front of canine to back of M ³	4.6	5.3
Forearm	32.5	34.5
Third metacarpal	31.5	33.8
First phalanx	10.7	11
Second phalanx	9.7	10.8

Type, old ♂, T. M. no. 2286, taken at Lormarins, Paarl District, 15th September, 1917, by J. S. Le Sueur, Esquire, by whom it was rescued from a cat.

Eptesicus melckorum sp. nov.

With the general characters of *E. capensis* (A. Smith), but differing therefrom in its much longer tail and larger size; the tail measures 40–45 mm. as against only 30–34 mm. in *E. capensis*, the forearm 35.5–37 as against 32–36, and the skull 14.5–15 as against 14. In colouration the upper parts are externally "avellaneous" (Ridgway) with the base of the hair brown, and the under parts paler, tending to white, with the base of the hair darker brown.

Type, adult ♀, T. M. no. 2283, taken at Kersfontein, Berg River, Cape Province, 21st November, 1917. Also four more adults and a very young specimen captured at the same time in a loft.

Dimensions: Head and body 53, tail 40, hind foot (c.u.) 7, ear 15 mm. Forearm 37; pollex (c.u.) 5.5; 3rd digit, metacarpal 36, 1st phalanx 13.2, 2nd 12.8, 3rd 9.9; 4th digit, metacarpal 35, 1st phalanx 12.2; 5th digit, metacarpal 35.8, 1st phalanx 10.5. Tibia 14. Tragus (dry) on the outer margin 6.3, breadth 2.

Chrysochloris minor sp. nov.

A small species apparently most closely allied to *C. asiatica* (L.), but differing therefrom in its much smaller size. Of about the same size as *C. wintoni* Broom, but differing therefrom in having the skull of the same shape as that of *asiatica*. Colouration much as in *C. asiatica*, specimens from Cape Town and the Frenchhoek valley, but with a more conspicuous sheen of metallic violet. Claws of the forefeet longer and narrower than in *asiatica* in proportion to the size of the species, the claws measuring: 1st 4 mm., 2nd 6.5, 3rd 11 × 4 (as

against 11×5 in *asiatica*), 4th 1.5. Length of the head and body, measured in the flesh, 94 mm.; hind foot (s.u.) 11. The skull similar to that of *asiatica* in outline, though smaller, but with the palate not extending behind the hindmost molar. The upper canine and foremost premolar are in contact, otherwise the position of the teeth is the same as in *asiatica*. Dimensions of the skull are: greatest length 22.1 mm.; basilar length 21.2; greatest width 17; greatest height 11.3; interorbital width, posteriorly 7, anteriorly 7.8; length of upper tooth row, from front of incisors to back of M^3 , 9.5; breadth of palate outside last premolar 8; length of palate to base of incisors 9; greatest length of mandible 14.7; length of mandibular tooth row 7.8.

Type, adult ♀, with fully developed mammae, taken in the sandveld at Klaver, on the Olifants River, Cape Province, 22nd September, 1917. The mammae are as in *asiatica*, one pair situated midway between the fore and hind legs, and one pair inguinal.

Mungos pulverulentus maritimus subsp. nov.

Intermediate between *M. pulverulentus* (Wagner) and *M. ruddi* Thomas, the colouration tending to that of *ruddi*, but with only a slight trace of black, in some individuals, at the tip of the tail. The colouration varies somewhat in individuals, a character also noted of specimens from Knysna, but is on the whole of a much more tawny reddish on the back and particularly on the tail; the base of the hair is pale grey on the back, as compared with dark brown to grey brown in *pulverulentus*, while the tail shows very little brown banding, this giving way to a more uniform tawny brown; the hands and feet and face are also much lighter brown. In the skull also, this subspecies apparently forms a link between the two forms so far regarded as distinct species, but which must now be regarded as merely subspecies. For purposes of comparison, a specimen taken at Lormarins, Paarl District, has been taken as typical, and the measurements of the series, together with those given for *ruddi*, are as follows:

	Paarl	Lamberts Bay	Port Nolloth
Head and body	325	325-360	347
Tail	280	285-325	315
Hind foot	62	62-68	69
Ear	25	16-25	26
Skull:			
Greatest length	67.3	66-72	69
Basilar length	61	61.5-65	—
Zygomatic width	35.5	35-39	39.5
Interorbital constriction	13.5	14.6-15.2	16.5
Length P^4	7.3	7.3-7.5	7
Greatest diameter P^4 ...	9	8.4-8.7	8
" " M^2	4.5	3.8-4	3.6

Type, adult ♀, Lamberts Bay, T. M. 2136, 16th October, 1917. Mammae: 3 abdominal pairs = 6. Six specimens in the series from same locality, from which the above measurements have been taken.

Otomys silberbaueri sp. nov.

A member of the *O. laminatus* group, with nine laminae in M^3 and seven in M_1 ; but differing therefrom in its very dark colouration and larger size.

Colouration: base of the hair on the whole of the upper parts dark slaty black, the external portion tawny and terminally glossy green; the eyes are surrounded by an ill-defined ring of reddish tawny, and the snout is more yellowish; below the base of the fur is greyer, the tips whitish, the sides merging from the colouration of the back to the paler colour of the underparts. Fore feet greyish white, hind feet greyish tawny, darker on the sides and toes, and merging up the limbs to the darker colour of the back. Tail dorsally black, laterally and ventrally uniform dull white. Dorsally in general effect the colour is darker than in the darkest specimens of *Otomys irroratus*. The skull does not differ materially from that of *O. laminatus*, but the tooth row is very much larger, the upper molars measuring 11 mm. as against 10 in *laminatus*. Dimensions, taken in the flesh: length of the head and body 172 mm., tail 110, hind foot (s.u.) 34, ear 24. Skull: greatest length 44.5; zygomatic width 22; width of brain case 16.5; interorbital width 5; nasals, length 20, breadth 7.8; length of upper molar series (crowns) 11; diastema 9.5; length of bullae 7, width (including meatus) 8.5.

Type, old ♂, T. M. no. 2259, taken at Lormarins, Paarl District, 7th September, 1917. Specimens of *Otomys irroratus* were captured in the same marsh

SOME NOTES ON BIRDS, AND DESCRIPTIONS OF NEW SUBSPECIES

By AUSTIN ROBERTS

DURING an expedition to the Cape Province for the purpose of obtaining topotypes of various species, some new and quite unexpected forms were secured. These were unexpected inasmuch as the avifauna of that Province is said to have been thoroughly worked, and the records hereafter given serve to show the folly of such statement.

Amongst the records of importance the following may be noted:

Crithagra leucoptera Sharpe. A single adult ♀ was obtained at Lormarins in the Paarl District, one of a small party, the rest of which flew off towards the mountains after I had secured the one; a shower of rain prevented me from following the others. There can be no doubt as to the validity of this species as the immature of *C. albogularis*, which it comes nearest to, have the rump yellow as in the adults.

Cryptillas victorini. A specimen was secured in the scrub on the Groot Drakenstein Mountains. So far this species does not appear to have been recorded from so far west. Its call-note is similar to that of *Bradypterus barratti* of the Drakensberg.

Bradypterus babaeculus (Vieillot). A specimen of this species was obtained in the rushes on the Berg River at Kersfontein. Reichenow has referred *B. barratti* Sharpe to this species and Stark and Sclater have referred *Lusciniola gracilirostris* (Hartlaub) to it. All writers have so far been able to recognize *Bradypterus brachypterus* (Vieillot) from Knysna; but owing to their not knowing that the call-notes of *brachypterus* and *babaeculus* are the same, some confusion has existed as to the identity of the latter. Levaillant, who first collected these birds, figured and described them, recorded *brachypterus* from Outeniqua only, but *babaeculus* from both Verloren Vlei (not far from Berg River) and Outeniqua (Knysna). This has probably also been a cause of error, the explanation of which is very likely that he himself collected the bird at Verloren Vlei and noted its call-note, which he probably remembered also to have heard at Knysna; on the other hand he frequently mentions in his *Travels* the assistance rendered to him in collecting by his faithful Klaas, so we may reasonably conclude that Klaas obtained the Knysna specimen and informed him of its feeble power of flight. Support is lent to this explanation by the fact that he does not mention the call-note of *B. brachypterus*. As a matter of fact the habitat, habits and call-notes of the two species are the same, the only difference between them being that *B. babaeculus* is a much darker bird, as shown by the coloured figure supplied by Levaillant.

+ *Bradypterus transvaalensis* sp. nov.

Lighter coloured in general effect than specimens of *B. brachypterus* from Knysna, but differing more markedly in the shortness of the bill. In *brachypterus* and *babaeculus* culmen measures over 15 mm. and the length of the bill from the anterior corner of the nasal hollow to the tip 9–10 mm. as against less than 14 and less than 8.5 mm. respectively, in the Transvaal specimens.

Type, adult ♂, in breeding plumage, taken at Wakkerstroom, on 25th October, 1909. Also two similar specimens from the same place. "Iris yellowish brown; maxilla brown, mandible pater; tarsi and feet dark flesh colour. Length in the flesh 158 mm." Wing 60, tail 63, tarsus 20, culmen 13.

Dryodromas fulvicapilla silberbauer subsp. nov. +

Differs from the typical *D. fulvicapilla* from the eastern districts of the Cape Province in being altogether darker coloured, the crown only slightly more inclined to reddish than the back (which is also darker than in typical specimens), the throat and belly less white, on the former hardly noticeably whitish.

Type, adult ♀, taken at the foot of the Groot Drakenstein Mountains, on the estate of C. C. Silberbauer, Esquire, "Lormarins," in the Paarl District, in September, 1917. Also another similar specimen taken at the same time. "Iris dull tan yellow; bill flesh coloured, culmen and tip brown; tarsi and feet flesh coloured. Length in the flesh 116 mm." Wing 46, tail 42, tarsus 17.5, culmen 10.5.

Note. Females of the typical birds are paler than males, so that possibly the males of this more western subspecies are still darker than the females secured.

Euplectes capensis macrorhynchus subsp. nov. +

Differs from the typical *E. capensis* from Cape Town and neighbouring districts in having an even larger, or in fact, an enormously powerful, bill, the culmen in the type measuring 21 mm. in an adult male in full breeding plumage, as against only 18-19 mm. This measurement alone, however, does not give an impression of the increase in size, for the breadth and depth are still greater in proportion. In an immature ♂ taken about the same time and place, the culmen is 20.5 mm. Type, adult ♂ in breeding plumage, taken at Klaver on the Olifants River, Cape Province, October, 1917. Also an immature ♂.

Careful measurements of the long series of specimens shows an extraordinary constancy in the length of the culmen amongst specimens from given ranges, and there is shown to be a graded (though not intergrading) increase in size, of which the following will give a clear idea.

Klaver	<i>macrorhynchus</i>	20.5-21
Cape Town and Paarl	<i>capensis</i>	18-19
Knysna	?	16.5-17
Drakensberg (Natal to Sabie)	<i>approximans</i>	15-15.5
	and of <i>Euplectes xanthomilas</i>	
Woodbush	—	15-16
Beira and Boror	—	13.5-14

Mirafra apiata adendorffi subsp. nov. +

Differs from the typical *Mirafra apiata* (Vieillot) in its larger size, less rufous outer and inner margins to the primaries, and more rufous head and back. There is only a faint trace of black markings on the feathers of the nape and head generally, while on the back the rufous is much more conspicuous, perhaps the effect of wear, but nevertheless much more extended than in typical birds.

Type, adult ♂, taken on the tableland, several thousand feet above the Olifants River at Klaver. It is much larger than an adult male taken at Lormarins and three others from Knysna and Grahamstown. Compared with the first the dimensions are as follows:

	Total Length	Wing	Tail	Tarsus	Culmen
Klaver ...	160	87	62	23	13·5
Lormarins	155	77	58	20	12·5

Proctopus nigricollis gurneyi subsp. nov.

Gurney (*Ibis*, 1868, p. 263 and 1869, p. 303) pointed out that the South African Eared Grebe, which breeds here, differed from European specimens in being smaller and having the ear coverts pater. This I am able to confirm from an adult ♂ in nuptial dress, taken at Lamberts Bay. The bill is apparently broader, though slightly shorter than in European specimens, and the ear coverts are almost entirely glossy straw yellow, with only a wash of chestnut on the lower fourth. I therefore confer this name upon the S. African birds in recognition of one who contributed much to our knowledge of birds in S. Africa.

Type, ♂, from Lamberts Bay, November, 1917, in Transvaal Museum Collection.

7.68

ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VI

PART 4 *containing*

Addendum to the First Check-list of the Flowering Plants and Ferns of the Transvaal and Swaziland. By MRS R. POTT, Botanist of the Transvaal Museum.



Issued September, 1920

PRINTED AT THE UNIVERSITY PRESS
CAMBRIDGE, ENGLAND

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VOL. 6

PART 4

ADDENDUM TO THE FIRST CHECK-LIST OF
THE FLOWERING PLANTS AND FERNS OF
THE TRANSVAAL AND SWAZILAND

By MRS R. POTT, Botanist of the Transvaal Museum

PREFACE.

THIS ADDENDUM to the First Check-list of the Flowering Plants and Ferns of the Transvaal and Swaziland, published May, 1912, in the *Annals of the Transvaal Museum*, Vol. III. No. 3, is chiefly based upon records from the Transvaal Museum Herbarium. Further are included those records given in the parts of the *Flora Capensis* and the *Flora of Tropical Africa*, those in the issues of the *Kew Bulletin*, the *Journal of Botany*, the second edition of Sim's *Ferns of South Africa*, the *Beiträge zur Kenntnis der Afrikanischen Flora*, *Annals of the Bolus Herbarium*, etc., published since 1912.

This Addendum is far from complete, but it is only given as a first one, which will be followed by others.

The flora of the Transvaal is very rich and many parts of the country are either poorly or not at all botanically investigated; e.g. every collection of plants, sent to the Transvaal Museum Herbarium from Messina (Z.), where Archdeacon Rogers has collected to such a great extent, has added new records to the Transvaal Flora. But even amongst collections from non-tropical parts of the Transvaal I often found new records, to say nothing of the probably new species amongst those plants I only identified as far as the genus. The latter, of which there are a good many in the Transvaal Museum Herbarium, I have not included in this list, unless it is a genus new to the flora.

The ferns in the First Check-list I altered according to Sim's second edition of the *Ferns of South Africa*, the genus *Lotononis* is split up into *Lotononis* and *Pearsonia*, and in the Orchids, the Gramineae, the Loranthaceae, the Crassulaceae, the Leguminosae and the Euphorbiaceae many alterations in the names had to be made to bring this List up to date. Here and there synonyms have been eliminated.

Incomplete as this List is, I expect it to be of use to the many workers in systematic Botany we have at present in the Transvaal.

R. P.

GLEICHENIACEAE.

Gleichenia linearis (Burm.) Clarke. Is *G. dichotoma* Willd. of first List.

HYMENOPHYLLACEAE.

Hymenophyllum Marlothii Brause. Kaapsche Hoop, Wager.

H. tunbridgense Sm. Kaapsche Hoop, Wager.

H. fumarioides Willd. Is *H. rarum* R.Br. of first List.

Trichomanes montanum Hook. Is *T. pusillum* Sw. of first List.

SCHIZAEACEAE.

Schizaea pectinata (L.) Sw. Kaapsche Hoop, Wager T.M.H. 1484.

CYATHEACEAE.

Hemitelia capensis (L.f.) Klf. Barberton, Thorncroft, 371; Burt-Davy, 4559.

POLYPODIACEAE.

Cystopteris fragilis (L.) Bernh. Mavriestad (E.), Mrs Pott, 4861.

Aspidium cicutarium (L.) Sw. Macmac, Ayres; Modjadjes (Ptbg.), Dec., Rogers, 18,103.

Polystichum aculeatum (L.) Schott. Barberton, J. Thorncroft; Pilgrim's Rest, Miss Collins.

P. aristatum (Forsk.) Presl. Is *Aspidium aristatum* Sw. of first List.

P. luctuosum Moore. Barberton, Dec., Mrs Pott, 5574; Thorncroft, T.M.H. 104; The Downs, Ptbg., Junod, 4044.

P. MacLeaii (Bkr.) Diels. Is *Aspidium MacLeaii* Bak. of first List.

P. pungens (Klf.) Presl. Is *Aspidium aculeatum* Sw. var. *pungens* of first List.

Cyrtomium falcatum (L.f.) Pr. Is *Aspidium falcatum* Sw. of first List.

Dryopteris africana (Desv.) C. Chr. Barberton, Miss Williams, T.M.H. 790.

D. athamantica (Kze.) O. Ktze. Is *Nephrodium athamanticum* Hook. of first List.

D. bergiana (Schl.) O. Ktze. Is *Nephrodium bergianum* Bak. of first List.

D. Buchanani (Bkr.) O. Ktze. Is *Nephrodium Buchanani* Bkr. of first List.

D. crenata (Forsk.) O. Ktze. Is *Nephrodium crenatum* (Forsk.) Sim of first List.

D. elongata (Sw.) Sim. Is *Nephrodium Filix-Mas* Rich. var. *elongatum* of first List.

D. gongyloides (Schk.) O. Ktze. Is *Nephrodium unitum* R.Br. of first List.

D. inaequalis (Schl.) O. Ktze. Woodbush, Dec., Mrs Pott, 4674; Pilgrim's Rest, Rogers, 14,377.

D. lanuginosa (Willd.) C. Chr. Is *Nephrodium catopteron* Hook. of first List.

D. mauritiana (Fée) C. Chr. Zoutpansberg, Nelson, 358.

D. mollis (Jacq.) Hieron. Is *Nephrodium molle* Desv. of first List.

D. prolifera (Retz.) C. Chr. Is *Polypodium proliferum* Presl. of first List.

D. silvatica (P. and R.) C. Chr. Is *Polypodium unitum* Hook. of first List.

D. thelypteris (L.) A. Gray. Is *Nephrodium Thelypteris* Desv. of first List.

Microlepia speluncae (L.) Moore. Is *Davallia speluncae* Bkr. of first List.

Blechnum attenuatum (Sw.) Mett. Is *Lomaria attenuata* Willd. of first List.

B. capense (L.) Schl. Pilgrim's Rest, Rogers, 18,673; The Downs (Ptbg.), Rogers, 21,945.

B. punctulatum Sw. Kaapsche Hoop, Wager.

B. tabulare (Thb.) Kuhn. Is *Lomaria boryana* Willd. of first List.

Asplenium abyssinicum Fée. Magaliesberg, Sanderson.

A. bipinnatum (Forsk.) C. Chr. Is *A. rutaefolium* Kze. of first List.

A. cuneatum Lam. var. *splendens* Kze. Woodbush, Jenkins, T.M.H. 798; Pilgrim's Rest, Miss Collins, T.M.H. 905.

A. lunulatum Sw. Is *A. erectum* Bory of first List.

A. lunulatum Sw. var. *gracile*. Is *A. erectum* Bory var. *lobatum* of first List.

A. platyneuron (L.) Oakes. Mavriestad (E.), Nov., Mrs Pott, 4860.

A. praemorsum Sw. Is *A. furcatum* Thb. of first List.

A. theciferum (H.B.K.) Mett. Is *Davallia concinna* Schrad. of first List.

Athyrium scandicinum (Willd.) Presl. Is *Asplenium aspidioides* Schl. of first List.

Gymnogramme aurea Desv. Is *C. argentea* Mett. var. *aurea* of first List.

Ceterach cordatum (Thb.) Desv. Is *Gymnogramme cordata* Schl. of first List.

C. cordatum (Thb.) Desv. var. *pinnatifidum* Sim. Heidelberg, Miss Leendertz, 1077; Zeerust, Jenkins, T.M.H. 985.

- Ceropteris calomelanos* (L.) Und. Transvaal, Herb. Bolus.
Pellaea dura (Willd.) Bkr. Magaliesberg, Burke; Rosehaugh, Sim.
P. Goudotii (Kze.) C. Chr. Is *P. pectiniformis* Baker of first List.
P. hastata (Thb.) Prtl. Is *P. calomelanos* Link. of first List.
P. pteroides (L.) Prtl. Kaapsche Hoop, Wager.
P. quadripinnata (Forsk.) Prtl. Is *P. consobrina* Hook. of first List.
P. viridifolia (Forsk.) Prtl. Is *P. hastata* Link. of first List.
Doryopteris concolor (L. and F.) Kuhn. Is *Pellaea geraniaefolia* Fée of first List.
Adiantopsis capensis (Thb.) Fée. Is *Cheilanthes capensis* Sw. of first List.
Hypolepis sparsisora (Schrad.) Kuhn. Haenertsburg, Nov., Mrs Pott, 4672; Selati Poort, Junod, 4430
Pteris biaurita L. Is *P. quadriaurita* Retz. of first List.
P. dentata Forsk. Is *P. flabellata* Thb. of first List.
Pteridium aquilinum (L.) Kuhn. Is *Pteris aquilina* L. of first List.
Polypodium loxogramme Mett. Is *Gymnogramme lanceolata* Hook. of first List.
P. polypodioides (L.) Hitch. Is *P. incanum* Sw. of first List.
Elaphoglossum conforme (Sw.) Schott. var. *latifolium* Sim. Kaapsche Hoop, Wager.
E. petiolatum (Sw.) Urban. Is *Acrostichum viscosum* Sw. of first List.

MARSILIACEAE.

- Marsilia macrocarpa* Presl. var. *biloba* (Willd.) Sim. Transvaal, Burt-Davy.

SELAGINELLACEAE.

- Selaginella depressa* A. Br. Rosehaugh, Sim; Magaliesbergen, Mrs Pott, 3711.

TAXACEAE.

- Podocarpus gracillimus* Stapf. Houtboschberg, Nelson, 423.

APONOGETONACEAE.

- Aponogeton natalense* Oliv. Bronkhorstspuit, Oct., Janse, T.M.H. 9870; Carolina, Sept., Roberts, T.M.H. 15,873.

HYDROCHARITACEAE.

- Lagerosiphon muscoides* Harv. var. *major*. Vaal River, Nelson, 69; Standerton, Oct., Schlechter, 3464; Middelburg, Nov., Jenkins, T.M.H. 9862.

GRAMINEAE.

- Eriochrysis pallida* Munro. Is *Saccharum munroanum* Hack. of first List.
Eulalia sericea Stapf. Is *Pollinia villosa* Spreng. of first List.
Ischaemum purpurascens Stapf. Lijdenburg, Wilms, 1679.
Trachypogon plumosus Nees. Is *Trachypogon polymorphus* Nees var. *capensis* Hack. of first List.
Amphilophis glabra Stapf. Is *Andropogon intermedius* R.Br. var. *punctatus* Stapf. of first List.
A. insculpta Stapf. Barberton, Dec., Mrs Pott, 5541.
Monocymbium cerasiiforme Stapf. Is *Andropogon cerasiaeformis* Nees of first List.
Schizachyrium semiberbe Nees. Is *Andropogon hirtiflorus* Kunth var. *semiberbis* Stapf. of first List.
Andropogon Schinzii Hack. Johannesburg, Pillans, 1822.
Sorghum verticilliflorum Stapf. Is *Sorghum halepense* Nees var. *effusum* of first List.
S. versicolor J. N. Anderson. Rustenburg, Burt-Davy, 9305.
S. purpureo-sericeum Aschers. and Schweinf. Is *Andropogon purpureo-sericeus* Hack. of first List.
Hyparrhenia rufa Stapf. Is *Cymbopogon rufus* (Kth.) Rendle of first List.
H. hirta Stapf. Is *Cymbopogon hirtus* (L.) Stapf. of first List.
H. Ruprechtii Fourn. Is *Cymbopogon Ruprechtii* (Hack.) Rendle of first List.
Themeda triandra Forsk. Is *T. Forskalii* Hack. of first List.
Digitaria diagonalis Stapf. Pretoria, Jan., Miss Leendertz, 1090.
D. horizontalis Willd. White River, March, Rogers.
D. longiflora Pers. Woodbush, Jan., Wager, T.M.H. 12,582.
D. monodactyla Stapf. var. *explicata* Stapf. Various localities.
D. tricholaenoides Stapf. Various localities.
Panicum obscurum Stapf. Pretoria, March, Miss Leendertz, 4417.

- Panicum stagninum* Koenig. Potchefstroom, March, Miss Leendertz, 3266.
P. subulifolium Mez. Haenertsburg, Nov., Mrs Pott, 4802.
P. typhurum Stapf. Woodbush, Jan., Wager, T.M.H. 13,858.
Brachiaria brizantha Stapf. Is *Panicum brizanthum* Hochst. of first List.
B. Isachne Stapf. Is *Panicum Isachne* Roth of first List.
B. nigropedata Stapf. Is *Panicum nigropedatum* Munro of first List.
B. regularis Stapf. Shilovane, Junod, 123.
B. serrata Stapf. Is *Panicum serratum* Spreng. of first List
Pennisetum typhoideum Rich. Spelonken, Nelson, 83.
Sporobolus discoporus Nees. Sixmiles Spruit, Oct., Schlechter, 3580.
S. pectinatus Hack. var. *coloratus*. Johannesburg, April, Mrs Hutton, 253.
Eragrostis aspera Nees. Onderstepoort, T.M.H. 14,808.
E. tenella Stapf var. *plumosa*. Maxabeni, March, Schlechter, 4659; Pietersburg, April, Rogers; Kaapsche Hoop, March, Rogers, 20,825.

CYPERACEAE.

- Scirpus dioecus* Boeck. Warmbaths, Aug., Miss Leendertz, 1168.
S. griquensium C.B.Cl. Spitskop (E.), Dec., Mrs Pott, 5230.
Bulbostylis trichobasis C.B.Cl. Pretoria, Nov, Miss Leendertz, 1646.

ARACEAE.

- Zantedeschia aethiopica* Spreng. Mavrierstad (E.), Nov., Mrs Pott, 5290.
Z. albomaculata Baill. Volksrust, Jan., Jenkins, T.M.H. 9286.
Z. melanoleuca Engl. Barberton, Dec., Thorncroft, T.M.H. 2758; Duivelskloof, Dec., Mrs Haar, T.M.H. 10,457; Hlatikulu (Sw.), Nov., Miss Collins, T.M.H. 13,660.

JUNCACEAE.

- Juncus gracilis* N.E.Br. Near Modderfontein, Conrath. 1173.
J. lomatophyllus Spreng. Haenertsburg, Nov., Mrs Pott; Barberton, Oct., Thorncroft, 1041.

LILLIACEAE.

- Sandersonia aurantiaca* Hook. Hlatikulu (Sw.), Jan., Miss Stewart, T.M.H. 9522.
Anthericum erythrorrhizum Conrath. Modderfontein, Conrath, 777.
Kniphofia sarmentosa Kunth. Modderfontein, Conrath.
Aloe aculeata Pole-Evans. Zoutpansberg, Pienaar and Wickens.
A. affinis Berg. Lijdenburg, Aug., Wilms, T.M.H. 10,168.
A. Barbertoniae Pole-Evans. Barberton, Thorncroft; Swaziland, Davis.
A. davyana Schönl. Pretoria, May, Miss Leendertz, 166.
A. globuligemma Pole-Evans. M'Phathlele Location (Z.), Wickens and Pienaar.
A. longibracteata Pole-Evans. Near Lijdenburg, Pole-Evans.
A. Marshallii Wood and Evans. Piet Retief, Dec., Jenkins, T.M.H. 12,038.
A. myriacantha R. and S. Barberton, May, T. Thorncroft, T.M.H. 4345; Pilgrim's Rest, Feb., Miss Collins, T.M.H. 9897.
A. petricola Pole-Evans. Nelspruit, Pole-Evans; Elandshoek and Kaap Valley, Thorncroft.
A. Pienarii Pole-Evans. Smit's Drift (Ptbg.), Jan., Pienaar.
A. pretoriensis Pole-Evans. Pretoria, June, Miss Leendertz, 618; Miss Collins, T.M.H. 7137; Lijdenburg; Barberton and Lebombo Mountains.
A. sessiliflora Pole-Evans. Barberton, Wickens, Thorncroft.
A. Simii Pole-Evans. Near Sabie, Jan., Sim.
A. suprafoliata Pole-Evans. Swaziland, Davis; Lebombo Range, Warner; Forbes Reef, Roberts.
A. Thorncroftii Pole-Evans. Barberton, Sept., Thorncroft.
A. Verecunda Pole-Evans. Near Haenertsburg, Dec., Pienaar.
A. Wickensii Pole-Evans. M'Phathlele Location (Z.), Wickens and Pienaar.
Sansevieria deserti N.E.Br. Messina, Sept., Rogers, T.M.H. 18,813.
S. guineensis Willd. Is *S. thyrsoflora* Thunb. of first List.

AMARYLLIDACEAE.

- Pancratium spec.* Messina, Dec., Rogers, T.M.H. 19,337; Pienaar'srivier; Lijdenburg.

DIOSCOREACEAE.

Dioscorea dregeana Baker. Barberton, Dec., Mrs Pott, 5457; Waterval Onder, Dec. and Feb., Rogers, 14,300, 14,477.

IRIDACEAE.

Gladiolus aurantiacus Klatt. Hlatikulu (Sw.), Oct., Miss Stewart, T.M.H. 10,247; Piet Retief, Nov., Miss Collins, T.M.H. 13,626.
G. brachyphyllus Bol. f. Selati Railway, June, Rogers, 11,807.
G. inclusus Bol. f. Pilgrim's Rest, Dec., Rogers, 14,311.
G. magaliesmontanus Bol. f. Magaliesberg, near Aapies River, Nov., Schlechter, 3627.
G. marginatus Bol. f. Near Lijdenburg, Jan., Wilms, T.M.H. 6457.
G. pretoriensis O. Ktze. Pretoria, Jan.-March, Schlechter, 4151, Miss Leendertz, 603; Zeerust, Jan., Mrs Pott, 4406.
G. purpureo-auratus Hook. f. Volksrust, Jan., Jenkins, T.M.H. 9290.
G. varius Bol. f. Pilgrim's Rest, March, Rogers, 14,601.
G. varius Bol. f. var. *brevifolius*. Saddleback Mountain (Barb.), Feb., Galpin, 828.
G. varius Bol. f. var. *elatus*. Barberton, March, Galpin, 860.

MUSACEAE.

Musa Davyae Stapf. Houtboschberg, Burt-Davy.

ZINGIBERACEAE.

Kaempferia Ethelae Wood. Barberton, Steytler in Herb. Bolus, 6396; Nelspruit, Wilhelm, 4163; Spelonken, Mingard, 19; New Agatha, Reckenzaan, 6095; Groot Letaba, Swierstra, T.M.H. 2497.

ORCHIDACEAE.

Holothrix Reckii Bolus. Koedoes Poort (Pr.), Sept., L. Reck, Col. Herb. 1003; Pretoria, Sept., Miss Leendertz, 258; Knoppiesfontein (R.), Sept., Jenkins, T.M.H. 7207.
Brachycorythis Junodiana Kränzl. Shilovane, Junod, 2784.
B. ovata Ldl. Is *Platanthera ovata* (Ldl.) Schltr. of first List.
B. pubescens Harv. Is *Platanthera Brachycorythis* Schltr. of first List.
B. schlechteriana Kränzl. Transvaal, Schlechter.
B. Tysoni Bolus. Is *Neobolusia Tysoni* Schltr. of first List.
Habenaria Barbertoni Kränzl. and Schltr. Barberton, Culver, 81; Koedoes Poort, Reck, 165; Ermelo, Miss Leendertz, 3115.
H. bicolor Conrath and Kränzl. Modderfontein, Conrath, 1083.
H. foliosa Reichb. f. Is *H. polyphylla* Kränzl. of first List.
H. Galpini Bolus. Near Johannesburg, Galpin, 392; near Lijdenburg, Wilms, 1356, 1383.
H. incurva Rolfe. Transvaal, Galpin, 392.
H. orangana Reichb. f. Belfast, Burt-Davy, 1298; between Pilgrim's Rest and Sabie Falls, Burt-Davy, 5061; Bamboo Mountain, Drakensberg, Miss Doidge, 5573; Wakkerstroom, Jan., Roberts, T.M.H. 12,774.
H. polypodantha Reichb. f. Krokodilpoort (Pr.), April, Breyer, T.M.H. 13,843.
H. Rehmanni Bolus. Woodbush, Rehmann, 5780; near Barberton, Culver, 74.
H. Tysoni Bolus. Is *H. dregeana* Ldl. var. *Tysoni* of first List.
H. umvotensis Rolfe. Umvoti Creek, Barberton, Culver, 30, Galpin, 954.
Bonatea antennifera Rolfe. Potchefstroom, McLea in Herb. Bolus, 3028; Koedoes Poort (Pr.), Reck, 38, 58; Groenkloof, near Pretoria, Burt-Davy, 2430; near Potgietersrust, Burt-Davy, 5631.
B. Boltoni Bolus. Barberton, Culver, 18; Houtbosch, Schlechter, 4381.
Satyrium Atherstonei Reichb. f. Is *S. trinerve* Ldl. of first List.
S. wilmsianum Kränzl. Spitskop (Lij.), Wilms, 1380.
Schizochilus Gerrardi Bolus. Devils Knuckles (Lij.), Wilms, 1385.
S. Rehmanni Rolfe. Woodbush, Rehmann, 5849; near Lijdenburg, Atherstone; Macmac, Mudd.
S. strictus Rolfe. Is *Platanthera Zeyheri* (Sd.) Schltr. of first List.
S. transvaalensis Rolfe. Near Lijdenburg, Atherstone; Macmac, Mudd; Graskop, Burt-Davy, 1464.
Brownleea Nelsoni Rolfe. Transvaal, Nelson, 16.

- Monodenia lydenbergensis* Kränzl. Crocodile River (Lij.), Wilms, 1364.
Disa laeta Reichb. f. Is *D. Culveri* Schltr. of first List.
D. pulchra Sond. Hlatikulu (Sw.), Miss Stewart.
Disperis cardiophora Harv. Transvaal, Sanderson.
D. ermelensis Rolfe. Near Ermelo, Todd in Herb. Wood, 3176.
D. Nelsonii Rolfe. Houtbosch Mountains, Nelson, 493.
Eulophia aculeata Spreng. Barberton, Culver, 86.
E. Bakeri Rolfe. Near Johannesburg, Baker.
E. calanthoides Schltr. Near Nylstroom, Burt-Davy, 2011; Potgietersrust, Rogers, T.M.H. 2500.
E. inaemoena Kränzl. Shilovane, Junod, 2587.
E. latipetala Rolfe. Houtbosch, Bolus, 10,975.
E. Nelsoni Rolfe. Pretoria district, Nelson, 297; Spitskop (E.), Scheepers, T.M.H. 15,024.
E. papillosa Schltr. Barberton, Thorncroft, T.M.H. 4857; Mrs Pott, 5382.
E. Rehmanni Rolfe. Houtbosch, Rehmann, 5845.
E. stenantha Schltr. Elandspruit Mountains, Schlechter, 4004.
E. Stewartiae Rolfe. Hlatikulu (Sw.), Miss Stewart, 41.
E. Watkinsonii Rolfe. Ermelo, Watkinson; near Barberton, Galpin, 509; Swaziland, Miss Stewart, 42.
Lissochilus Rehmannii Rolfe. Aapies River, Rehmann, 4297; Pretoria, McLea in Herb. Bolus, 5819 a, Miss Tennant, 4040; Koedoes Poort, near Pretoria, Reck, T.M.H. 1004.
L. transvaalensis Rolfe. Tzaneen (Ptbg.), Burt-Davy, 2900.
L. Wakefieldii Reichb. f. and S. Moore. Potgietersrust, Miss Leendertz, 1929.

PIPERACEAE.

- Peperomia retusa* A. Dietr. var. *ciliolata* C.DC. Barberton, Jan., Janse, T.M.H. 9876; Belfast, Dec., Miss Leendertz, 2938.

ULMACEAE.

- Chaetachme aristata* Planch. Barberton, Dec., Mrs Pott, 5699.
C. microcarpa Rdl. Potgietersrust, May, Rogers, T.M.H. 17,732.

MORACEAE.

- Ficus ingens* Miq. Limpopo Valley, Umkiva, Hutchins, 14
F. mallotocarpa Warb. Limpopo Valley, Hutchins, 17.
F. Petersii Warb. Is { *F. Galpinii* Warb. of first List.
 { *F. Dinteri* Warb. of first List.
 { *F. Schinziana* Warb. of first List.

URTICACEAE.

- Fleurya peduncularis* Wedd. of first List is a synonym of *F. capensis* Wedd.

LORANTHACEAE.

- Loranthus Galpinii* Schinz. Barberton, Nov., Miss Williams, T.M.H. 7668; Kaap River Valley, Galpin, 896.
L. garcianus Engl. Komati Poort, Kirk, 75.
L. kalachariensis Schinz. Potgietersrust, Tr. Col. Herb, 4557; Swaziland, Miss Stewart, T.M.H. 8897; Buffelskraal, Palala (Wg.), July, Dr Breyer in T.M.H.
L. Kirkii Oliv. Messina, Dec., Rogers, 22,122.
L. kraussianus Meisn. var. *transvaalensis* Sprague. Is *L. kraussianus* Meisn. of first List.
L. Moorei Sprague. Near Barberton, Moore.
L. namaquensis Harv. of first List is a synonym of *L. olaefolius* Cham. and Schl.
L. olaefolius Cham. and Schl. Various localities.
L. olaefolius Cham. and Schl. var. *Leendertziae* Sprague. Potgietersrust, Aug., Miss Leendertz, 1142.
L. quinquenervis Hochst. Transvaal, Sanderson.
L. rubromarginatus Engl. Is *L. glabriflorus* Conrath of first List.
Viscum combreticola Engl. Is *V. dichotomum* Harv. of first List.

SANTALACEAE.

- Thesium asterias* A. A. Hill. Various localities.
T. Burkei A. W. Hill. Various localities.
T. costatum A. W. Hill. Various localities.
T. cytisoides A. W. Hill. Waterval Onder, Jan., Jenkins, T.M.H. 6767.
T. floribundum A. W. Hill. Various localities.
T. goetzeanum Engl. Heidelberg, Schlechter, 4792; Houtbosch, Bolus, 11,158, 11,159.
T. gracilarioides A. W. Hill. Barberton, Galpin, 543; Swaziland, Saltmarshe in Herb Galpin, 1048.
T. gypsophiloides A. W. Hill. Near Barberton, Galpin, 758.
T. hirsutum A. W. Hill. Heidelberg, Gilfillan, 244.
T. impletum A. W. Hill. var. *rasum*. Pretoria, Rehmann, 4544; Suikerbosch Rand, Schlechter, 3507.
T. Junodii A. W. Hill. Shilovane, Junod, 1301; Haenertsburg, Dec., Mrs Pott, 4778.
T. magalimontanum Sond. Various localities.
T. natalense Sond. Shilovane, Junod, 749; near Lijdenburg, Schlechter, 3953; Bethal, Dec., Mrs Pott, 3623.
T. Nationae A. W. Hill. Rustenburg, Miss Nation, 266.
T. palliolatum A. W. Hill. Potgietersrust, Bolus, 11,008.
T. resedoides A. W. Hill. Warmbaths, Sept., Miss Leendertz, 1335, 1353.
T. spartioides A. W. Hill. Brugspruit, Nov., Schlechter, 3754; Vereeniging, Nov., Mrs Pott, 3940.
T. triflorum Thunb. Barberton, Dec., Mrs Pott, 5510; Shilovane, Junod, 523.
T. utile A. W. Hill. Various localities.

OLACACEAE.

- Ximenia caffra* Sond. Various localities.

AMARANTACEAE.

- Guilleminea illecebrionides* Kth. Warmbaths, Jan., Miss Leendertz, 2010.
Hermbstaedia capitata Schinz. Sandfontein, Jan., Schlechter, 4239; Warmbaths, Jan., Miss Leendertz, 2017.
Pupalia atropurpurea Moq. Johburg, Rogers, 1314; Pietersburg, Rogers, 13,639.
Psilotrichum africanum Oliv. Komati Poort, Rogers.

PHYTOLACCACEAE.

- Giesekia pharnaceoides* L. var. *pedunculata* Oliv. Rogers, 20,018.
G. pentadecandra E. Mey. Various localities.
Limeum glomeratum E. and Z. Standerton, Jan., Mrs Pott, 4104.

AIZOACEAE.

- Mollugo hirta* Th. Rogers, 19,446.
M. hirta Th. var. *virens* Fzl. Moss and Rogers, 67.
M. verticillata L. Rogers, 19,488.
Trianthema pentrandrum L. Rooiplaat (Pr.), March, Miss Leendertz, 776; Warmbaths, Jan., Miss Leendertz, 2005; Rustenburg, Oct., Mrs Pott, 3440; Swaziland, Nov., Miss Stewart, T.M.H. 10,234.
T. transvaalense Schinz. Madsaba, March, Schlechter, 4876; Haenertsburg, Nov., Mrs Pott, 4785.
Mesembrianthemum hamatum L. Bolus. Heidelberg, Nov., Miss Leendertz, 2460; Bloemhof, Roe in Herb. Bolus, 13,484.
M. nubigenum Schltr. Magaliesberg, Oct., Mrs Pott, 3738.
Pharnaceum pentandra Retz. Komati Poort, Rogers, 12,623.
P. Zeyheri Sond. Magaliesberg, Burke and Zeyher.

CARYOPHYLLACEAE.

- Cerastium dregeanum* Fzl. Spitskop (E.), Dec., Mrs Pott, 5117.
Dianthus micropetalus Ser. Various localities.

RANUNCULACEAE.

- Knowltonia glabricarpellata* Hutch. Kl. Olifant River, Schlechter, 3825.

Ranunculus Baurii McOwan. Various localities.

R. Cooperi Oliv. of first List is a synonym of *R. Baurii* McOwan.

Thalictrum minus L. Vaalriver, Nelson, 71; Vereeniging, Nov., Mrs Pott, 3753.

MENISPERMACEAE.

Coccolus villosus DC. Blauwkop (Z.), July, Dr Breyer; Silwane's location (Ptbg.), July, Dr Breyer, T.M.H. 17,581.

Stephania discolor Spreng. Barberton, Thorncroft, 637.

ANONACEAE.

Hexalobus senegalensis A.DC. Waterpoort (Z.), Sept., Rogers, 21,545.

PAPAVERACEAE.

Fumaria Mundtii Spreng. Mavriestad (E.), Nov., in shady kloof, Mrs Pott, 5133.

CRUCIFERAE.

Arabis perfoliata Lam. Goede Hoop Farm (E.), Dec., Mrs Pott, 5134.

Brassica pachypoda Thellung. Various localities.

Roripa nudiuscula (E. Mey) Thellung. Pretoria, Rehmann, 4234; Suikerboschrand, Schlechter, 3483; Shilovane, Junod, 1334.

CAPPARIDACEAE.

Cleome chilocalyx Oliv. Rayton (Pr.), Rogers, 12,906.

Capparis transvaalensis Schinz. Prope Mailas Kop, Schlechter, 4512.

Cadaba natalensis Sond. Barberton, June, Thorncroft, T.M.H. 2482.

Maerua rigida R.Br. Komati Poort, Nov., Rogers, T.M.H. 13,283.

CRASSULACEAE.

Cotyledon trigyna Burch. Various localities.

C. Wickensii Schönl. Smit's Drift, Wickens; Zoutpansberg, Hardenberg, T.M.H. 12,990.

Kalanchoe glandulosa Hochst. var. *tomentosa*. Nylstroom, May, Rogers, T.M.H. 2508; Spelonken, Nov., Jenkins, T.M.H. 8162; Hlatikulu (Sw.), June, Miss Stewart, T.M.H. 8840.

K. Junodii Schinz. Shilovane, Junod.

K. sexangularis N.E.Br. Barberton, Thorncroft.

Crassula Cooperi Rgl. var. *Krugersdorp*, Jan., Jenkins, 10,369 T.M.H.

C. filamentosa Schönl. Fairy Glen (Pr.), March, Miss Leendertz, 1121; Houtbosch, Rehmann, 5966.

C. inaequalis Schönl. Hlatikulu (Sw.), March, Miss Stewart, 108, T.M.H. 9624.

C. natans Thb. (Forma *obovata*). Belfast, Jan., Jenkins, T.M.H. 6780.

C. pectinata Conrath. Modderfontein, Conrath, 287.

C. peplodes Harv. Lijdenburg, Oct., Dr Wilms, T.M.H. 6473.

C. perfoliata L. var. Barberton, June, Thorncroft, T.M.H. 10,393.

C. transvaalensis O.K. Is *C. subulata* Hook. of first List.

C. Vaillantii (Willd.) Schönl. Hooge Veld, Rehmann, 6688.

ROSACEAE.

Alchemilla Wilmsii Engl. Near Middelburg, Wilms, 458; Middelburg, Nov., Jenkins, T.M.H. 9837; Ermelo, Dec., Mrs Pott, 4945; Belfast, Dec., Miss Leendertz, 2697.

Rubus rigidis Sm. Heidelberg, Dec., Miss Leendertz, 1069; Rustenburg, Oct., Mrs Pott, 3380; Barberton, Nov., Miss Williams, T.M.H. 7658.

R. rigidis Sm. var. *chrysocarpus*. Near Pretoria, Nov., Miss Leendertz, 661; Groot Olifants River, Nov., v. Niekerk, T.M.H. 7563.

Sanguisorba muricata Spach. Bethal, Dec., Mrs Pott, 3570.

LEGUMINOSAE.

Albizzia nearest A. *anthelmintica* Bronqn. Waterpoort (Z.), Sept., Rogers, 21,504.

A. hypoleuca Oliv. Komati Poort, Dec., Rogers, 22,246.

Acacia Benthami Rochbr. Is *A. arabica* Willd. var. *kraussiana* of first List.

A. Karroo Hayne. Is *A. horrida* Willd. of first List.

- Acacia ferox* Bth.
A. heteracantha, Burch. } of first List are doubtful species.
A. rehmanniana Schinz }
Erythrophloeum guineense Don (as far as material to hand). Mashishimale (Z.),
 March, T.M.H. 19,423.
Cassia holosericea Fresen. Newington (Ptbg.), Rogers, 22,504; Moss and Rogers, 36.
Pleiospora (*Phaenohoffmannia*) Bolusii Düm. Houtbosch, Bolus, 10,995.
P. cajanifolia Harv. Various localities.
P. gracilior Düm. McLea in Herb. Bolus, 5621.
P. holosericea Schinz. Various localities.
P. latebracteolata Düm. Various localities.
P. macrophylla Düm. Macmac, Atherstone.
P. paniculata Düm. Houtbosch, Bolus, 11,034.
P. obovata Schinz. Houtbosch, Rehmann, 6249; Waterval Boven, Feb., Rogers,
 14,468.
P. obovata Schinz var. *brevipedunculata* Düm. Macmac, Atherstone.
Lotononis Bainesii Baker. Various localities.
L. calycina Bth. var. *acuta* Düm. Lijdenburg, Wilms, 272, 273.
L. calycina Bth. var. *hirsutissima* Düm. Various localities.
L. dichiloides Sond. Mavriestad (E.), Dec., Mrs Pott, 5071.
L. Gerrardi Düm. var. *transvaalensis*. Kl. Olifant River, Schlechter, 3809.
L. humilior Düm. Lijdenburg, Wilms, 274.
L. lanceolata Bth. Johannesburg, Rand, 1111; Belfast, Dec., Miss Leendertz, 2866.
L. laxa E. and Z. var. *multiflora* Düm. Various localities.
L. Marlothii Engl. Christiana, Nelson, 197.
L. pulchra Düm. Lijdenburg, Wilms, 280.
L. sericiflora Düm. Standerton, Rehmann, 6802; Standerton, Jan., Mrs Pott,
 4101; Ermelo, Feb., Miss Leendertz, 3036.
L. solitudinis Düm. Carolina, Nov., Rademacher, T.M.H. 7271.
L. transvaalensis Düm. Various localities.
L. Wilmsii Düm. Between Middelburg and Crocodile River, Wilms, 277.
L. Woodii Bolus. Standerton, Rehmann, 6794.
Pearsonia aristata Düm. Is *Lotononis aristata* Schinz of first List.
P. Atherstonei Düm. Various localities.
P. filifolia Düm. Is *Lotononis filifolia* Bolus of first List.
P. marginata Düm. Is *Lotononis marginata* of first List.
P. multiflora Düm. Is *Lotononis multiflora* Schinz of first List.
P. multiflora Düm, var. *Stewartii* Düm. Swaziland, Miss Stewart.
P. podalyriaefolia Düm. Swaziland, Saltmarshe in Herb. Galpin, 989.
P. propinqua Düm. Lijdenburg, Wilms, 261; near Middelburg, Wilms, 261 c.
P. Rogersii Düm. Is *Lotononis Rogersii* Kensit of first List.
P. sessilifolia Düm. Is *Lotononis sessilifolia* Harv. of first List.
P. swaziensis Düm. Is *Lotononis swaziensis* Bolus of first List.
Melolobium Wilmsii Harms. Between Drakensbergen and Pretoria, Wilms, 302.
Crotalaria distans Bth. Silwane's location, July, Dr Breyer, T.M.H. 18,652.
C. grantiana Harv. Madsaba, March, Schlechter, 4585.
C. lanceolata E. Mey. Barberton district, different collectors in T.M.H.
C. maxillaris Klotzsch. Near Pretoria, March, Miss Leendertz, 761; Zeerust, Jan.,
 Mrs Pott, 4369; Potchefstroom, March, Miss Leendertz, 3199.
C. Monteiroi Taub. Selati, July, Dr Breyer, T.M.H. 18,653.
C. natalitia Meisn. Barberton, Dec., Mrs Pott, 5337; Hlatikulu (Sw.), June, Miss
 Stewart, T.M.H. 8978.
C. petiolaris Franch. var. *australis* Bak. f. Pietersburg, Bolus, 10,375
C. pilulicarpa Taub. var. *Schinzii* Bak. f. Pietersburg, Bolus, 10,915.
C. Schinzii Bak. f. Sandriver, Schlechter, 4589.
C. spartioides DC. Matebe Valley, Holub; Zeerust, Jan., Mrs Pott, 4258.
C. spinosa Hochst. var. *Schlechteri* Bak. f. Magaliesberg, Nov., Schlechter, 3675;
 Beestkraal (R.), Dec., Jenkins, T.M.H. 6973.
C. squarrosa Schinz var. *Dinteri* Bak. f. Transvaal, Schlechter, 4263.
Argyrobolium longifolium Walp. Various localities.
A. Muddii Düm. Macmac, Mudd.

- Argyrobium Wilmsii* Harms. Lijdenburg, Wilms, 257.
Buchenroedera viminea Presl. Farm Nooit Gedacht (E.), Dec., Mrs Pott, 5070.
Lotus nearest *L. arabicus* L. Messina, Dec., Rogers, 20,702.
Indigofera rufescens E. Mey. Spitskop (E.), Dec., Mrs Pott, 5083.
I. stricta L. Pretoria, Jan., Miss Leendertz, 551.
Psoralea Wilmsii Harms. Various localities.
Teramnus labialis Spr. Lijdenburg, Wilms, T.M.H. 5890; Pretoria, Dec., Miss Leendertz, 460; Shilovane, March, Junod, T.M.H. 4930.
Tephrosia macropoda E. Mey. Haenertsburg, Nov., Mrs Pott, 4636; Hlatikuku (Sw.), Miss Stewart, T.M.H. 9533; Nelspruit, Dec., Dr Breyer, T.M.H. 17,873.
T. nubica Baker. Waterpoort (Z.), Sept., Rogers, 21,524.
Sesbania punctata DC. Macoutsie, July, Dr Breyer, T.M.H. 18,664.
S. tetraptera Hochst. Brakrivier, March, Schlechter, 4620.
Lessertia perennans DC. var. *sericea*. Germiston, Rogers, 12,199 c.
L. perennans DC. var. *polystachya* Harv. Is *L. polystachya* Harv. of first List.
Astragalus burkeanus Bth. Koedoes Poort, May, Miss Leendertz, 627; Haenertsburg, Nov., Mrs Pott, 4519; The Downs (Ptgb.), Dec., Rogers and Moss.
Desmodium dregeanum Bth. Shilovane, March, Junod, T.M.H. 5284.
D. natalitium Sond. Barberton, Dec., Mrs Pott, 5334.
Dalbergia melanoxylon Guill. and Perr. Komati Poort, Dec., Rogers, 22,171; Moss and Rogers, 580.
Mucuna urens DC. Shilovane, Junod, 2393.
Rhynchosia komatiensis Harms. Between Spitskop and Komati River, Wilms, 374.
R. secunda E. and Z. Carolina, Dec., Rademacher, T.M.H. 10,491; Ermelo, Feb., Miss Leendertz, 3120; Rustenburg, Oct., Mrs Pott, 3431.
Pueraria ficifolia L. Bolus. Is *Rhynchosia ficifolia* Bth. of first List.
P. Rogersii L. Bolus. Selati Railway, Rogers, 11,806.

GERANIACEAE.

- Geranium incanum* L. Various localities.
G. incanum L. var. Farm Goede Hoop, Dec., Mrs Pott, 4971.
Pelargonium Bowkeri Harv.
P. reniforme Curt. Wolmaransstad, Feb., Rogers, 22,704; Boksburg, Jan., Breyer, T.M.H. 15,519.
P. zonale Willd. Waterval Onder, Rogers, 632.

ERYTHROXYLACEAE.

- Erythroxyton caffrum* Sond. Near Barberton, Oct., Thorncroft, 1045.

ZYGOPHYLLACEAE.

- Tribulus Zeyheri* Sond. On lands of Mapagoni (Z.), July, Dr Breyer, T.M.H. 16,044; Messina, March, Rogers, 19,373.

CONNARACEAE.

- Cnetis natalensis* Planch. and Sond. Haenertsburg, Nov., Mrs Pott, 4477.

RUTACEAE.

- Fagara Davyi* Verdoorn. Woodbush, Grenfell in Col. Herb. 1094; Pototato Bush (Ptbg.), Burt-Davy, 1166; Eastwood in Col. Herb., 1298; Forbes's Reef Bush (Sw.), Burt-Davy, 2753.
F. Thorncroftii Verdoorn. Barberton, Dec., Thorncroft in T.M.H. 9616.
F. capensis Thunb. Is *Xanthoxylon capense* Harv. of first List.
Thamnosma africanum Engl. The Downs (Ptbg.), Nov., Rogers, 22,000.
Toddalia aculeata Lam. Modjadjes (Ptbg.), Dec., Rogers, 18,119.
T. natalensis Sond. Waterpoort (Z.), Sept., Rogers, 21,542; Kaapsche Hoop, Aug., Rogers, T.M.H. 18,798.

BURSERACEAE.

- Commiphora* species. New species collected at Messina by Archdeacon Rogers.
C. lugardae N.E.Br. Messina, March, Rogers, 20,762.

MELIACEAE.

- Turraea obtusifolia* Hochst. Rustenburg, Feb., van Dam, T.M.H. 16,517; Nelspruit,

- Dec., Dr Breyer, T.M.H. 17,692; Geelhoutkop (Wg.), Jan., Dr Breyer, T.M.H. 17,826; Kaapsche Hoop, March, Rogers, 20,828.
 T. nilotica Kotschy. Free State Mine (Z.), June, Dr Breyer, T.M.H. 17,571; The Downs, Nov., Rogers, T.M.H. 18,935 (in fruit).

POLYGALACEAE.

- Polygalá hispida* Burch. Vlakfontein (E.), Rogers, 11,522.
P. Rehmanni Chodat.
P. rigens A.DC.
Muraltia azorella Chod. Lijdenburg.
M. conjuncta Chod. Swazieland, Galpin, 531.
M. empetroides Chod. Houtbosch.

EUPHORBIACEAE.

- Monadenium Lugardae* N.E.Br. Great Letaba, near Birthday Road, June, Dr Breyer in T.M.H.
Elaeophorbia acuta N.E.Br. Transvaal, Burtt-Davy.
Euphorbia Bolusii N.E.Br. Near Middelburg, Bolus, 9767.
E. clavigera N.E.Br. Near Bremersdorp (Sw.), Burtt-Davy, 3010.
E. enormis N.E.Br. Pietersburg, Marloth, 5144
E. epicyparissias E. Mey. Is *E. involucrata* E. Mey of first List.
E. Evansii Pax. Near Barberton, Evans; Potgietersrust, Burtt-Davy, 5657.
E. glauccella Pax. Waterpoort (Z.), Rogers, 22,505.
E. Gueinzii Boiss. Various localities.
E. hirta L. Is *E. pilulifera* of first List.
E. hypericifolia L. Shilovane, Junod, 644; Kaap Muiden, Thorncroft, 758; Hlatikulu (Sw.), July, Miss Stewart, T.M.H. 8868.
E. inaequilatera Sond. Is *E. sanguinea* Hochst. of first List.
E. ingens E. Mey. Near Barberton, Pole-Evans, 2919, 2931; Potgietersrust, Burtt-Davy, 2200, 5658.
E. kraussiana Bernh. var. β . Houtbosch, Rehmann, 5913; Barberton, Dec., Thorncroft, 768; Mrs Pott, 5441; The Downs (Ptbg.), July, Rogers, 20,358.
E. natalensis Bernh. Ermelo, Burtt-Davy, 5402; Tzaneen, Nov., Rogers, 12,580.
E. neopolycnemoides Pax and Hoffm. Various localities.
E. Tirucalli L. Moorddrift, Oct., Miss Leendertz, 2245; Potgietersrust, Madge, 8443; Marloth, 5146; Burtt-Davy, 1700; Mafutane, Bolus, 12,279; Komati Poort, June, Rogers.
E. transvaalensis Schltr. Is *E. Galpini* Pax of first List.
E. trichadenia Pax. Various localities.
E. truncata N.E.Br. Various localities.
Bridelia cathartica Bertol. Komati Poort, Kirk, 100; Rogers, T.M.H. 16,007; Barberton, Pole-Evans, 2945.
B. mollis Hutch. Various localities.
B. stipularis Blume in first List is an Indian species.
Croton Gubouga S. Moore. Olifants River (Lg.), Pole-Evans; Pietersburg district (specimens in fruit in T.M.H.).
C. subgratissimus Prain. Is *C. gratissimus* Burch. of first List.
C. sylvaticus Hochst. Modjadjes (Ptbg.), Rogers, 18,120.
Flüggea microcarpa Blume. Barberton, Thorncroft, Rogers, Mrs Pott; Potgietersrust Sept. and Jan., Miss Leendertz, 1244, 1940.
Jatropha pseudoglandulifera Pax. Messina, Dec., Moss and Rogers, 78.
Cluytia affinis Sond. Pietersburg and Lijdenburg districts.
C. hirsuta E. Mey. Various localities.
C. laxa Eckl. Lijdenburg, Wilms, 1318; Barberton, Galpin, 934.
C. monticola S. Moore. Various localities.
C. virgata Pax and Hoffm. Various localities.
Acalypha angustata Sond. Many localities.
A. caperonioides Baill. Many localities.
A. caperonioides Baill. var. *Galpini* Prain. Barberton, Galpin, 1106.
A. ciliata Forsk. Shilovane, Junod, 2188, 1028.
A. depressinervia K. Schum Is *A. Schinzii* Pax of first List.

- Acalypha glabrata* Thb. Crocodile River (Pr.), Feb., Miss Leendertz, 716; Barberton, Dec. Mrs Pott, 5507; Shilovane, Junod, 1100.
- A. glabrata* Thb. var. *latifolia* Müll. Arg. Goedgedacht, March, Schlechter, 4602; Barberton, Jan., Miss Thorncroft, T.M.H. 4328; Krokodilpoort (Pr.), May, Dr Breyer, T.M.H. 13,852.
- A. glabrata* Thb. var. *pilosa* Pax. Near Goedgedacht, Schlechter, 4602 partly.
- A. punctata* Meisn. Various localities.
- A. punctata* Meisn. var. *longifolia* Prain. Various localities.
- A. punctata* Meisn. var. *Rogersii* Prain. Various localities.
- A. segetalis* Müll. Arg. Various localities.
- A. senensis* Klotz. Various localities.
- A. Wilmsii* Pax. Various localities.
- Adenocline acuta* (Thb.) Baill. Mavieriestad (E.), Nov., Mrs Pott, 4961; Barberton, Dec., Mrs Pott, 5491.
- Plukenetia africana* Sond. Palalariver (Wg.), Jan., Dr Breyer, T.M.H. 18,071.
- Dalechampia Kirkii* Prain. Komati Poort, Kirk, 60.
- Ctenomeria capensis* Harv. Barberton, Dec., Mrs Pott, 5494.
- Tragia affinis* Müll. Arg. Vaal River, Zeyher, 1526.
- T. incisifolia* Prain. Near Komati River, Bolus, 9779; Komati Poort, Schlechter, 11,781.
- T. natalensis* Sond. Barberton, Dec., Mrs Pott, 5497.
- T. Rogersii* Prain. Waterval Onder, Oct., Rogers, T.M.H. 2597.
- T. Sonderi* Prain. Crocodile River, Burke; Magaliesberg, Zeyher and Burke; near Mbabane (Sw.), Bolus, 12,290.
- Phyllanthus Rogersi* Hutch. Haenertsburg, Rogers, 19,023.

ANACARDIACEAE.

- Heeria pulcherrima* Oliv. The Downs (Ptbg.), Nov., Rogers, 22,005.
- Odina velutina* Rich. Messina, Dec., Rogers, 22,119.
- Rhus Coriacea* Engl. Is *R. magalismsontana* Sond. of first List.
- R. gracillima* Engl. Is *R. filiformis* Schinz of first List.
- R. villosa* L.f. of first List is included in *R. incana* Mill.

HIPPOCRATEACEAE.

- Hippocratea obtusifolia* Roxb. Waterpoort (Z.), Sept., Rogers, 21,544.

MELIANTHACEAE.

- Bersama transvaalensis* Turrill. Barberton, Thorncroft, 817.

RHAMNACEAE.

- Phylica paniculata* Willd. Transvaal.

VITACEAE.

- Cissus capensis* Willd. Rietfontein (Ptbg.), Sept., Miss Leendertz, 833; Elandshoek, Sept., Rogers, T.M.H. 4848.
- C. fragilis* E. Mey. Barberton, Dec., Mrs Pott, 5694.

TILIACEAE.

- Corchorus hirsutus* L. Geelhoutkop (Wg.), Jan., Dr Breyer, T.M.H. 17,821; Messina, Sept., Rogers, 19,356; Wyliespoort (Z.), Feb., Dr Breyer, T.M.H. 19,572.
- C. tridens* L. Motepe, March, Schlechter, 4627; Rooiplaat (Pr.), Feb., Dr Breyer, T.M.H. 15,176; Barberton, Dec., Mrs Pott, 5629.
- Grewia rhytidophylla* K. Schum. Messina, Moss and Rogers, 17,101.
- G. villosa* Willd. Messina, Moss and Rogers, 77.

MALVACEAE.

- Abutilon angulatum* Mast. Shilovane, March, Junod, T.M.H. 5261; Ngelelle River (Z.), July, Dr Breyer, T.M.H. 16,024.
- Hibiscus aponeurus* Spr. and Hutch. Joes Luck, near Barberton, Miss Thorncroft, Nov., T.M.H. 4989; Nelspruit, Dec., Dr Breyer, T.M.H. 17,961.
- H. diversifolius* L. Selati Railway, Rogers, 2708.
- H. lunariifolius* Wall. Various localities.
- H. surattensis* L. Hlatikulu (Sw.), June, Miss Stewart, T.M.H. 13,953.
- H. ternatus* Mast. Letsitele, Rogers, 2673

STERCULIACEAE.

- Melhania prostrata* DC. Is *M. rostrata* DC. of first List.
Dombeya rotundifolia Harv. Is *D. densiflora* of first List.
Hermannia comosa Burch. Christiania, Nelson, 200.
H. grisea Schinz. Near Brakriver, March, Schlechter, 4631.
H. grosseserrata Schinz. Matye, March, Schlechter, 4628.
H. macowanii (Szyszy.) Schinz. Marabastad, March, Schlechter, 4683.
Sterculia triphaca R.Br. Ngelelle River (Z.), July, Dr Breyer, T.M.H. 16,009; Waterpoort (Z.), Sept., Rogers, 21,535.

ELATINACEAE.

- Bergia suffuticosa* Fzl. Messina, Sept., Rogers, 19,303.

CANELLACEAE.

- Warburgia Breyeri* Pott. Near Macoutsie River, July, Dr Breyer, T.M.H. 17,573.

FLACOURTIACEAE.

- Trimeria trinervis* Harv. Mavrieriad (E.), Nov., Mrs Pott, 5115.
Scolopia Mundtii (Arn.) Warb. Farm Nooit Gedacht (E.), Dec., Mrs Pott, 5097.
S. Zeyheri Arn. Derde Poort (Pr.), July, Miss Leendertz, 190.

TURNERACEAE.

- Wormskioldia glandulifera* Klotzsch. Griffin Mine (Z.), Jan., Dr Breyer, T.M.H. 15,629; Messina, June, Rogers, 19,405.
W. serrata Hochst. Maxaben, March, Schlechter, 4671; Messina, March, Rogers, 20,823.

PASSIFLORACEAE.

- Trypsothema arenophilum* Pott. Warmbaths, Jan., Miss Leendertz, 2062.
Adenia glauca Schinz. Magaliesberg, between Kameelpoort and Elandsriver, Rehmann, 4799; Vygeboompoort (Wg.), Oct., van Dam, T.M.H. 13,715.
A. multiflora Pott. Baviaanspoort (Pr.), Dr Fehrson, T.M.H. 13,786.
A. Schlechteri Harms.
A. stenophylla Harms. Lijdenburg, Dec., Wilms, 941.
A. Wilmsii Harms. Lijdenburg, Nov., Wilms, 961; August, Wilms, 1897.

THYMELAEACEAE.

- Lasiosiphon canoargentea* C. H. Wright. Near Lijdenburg, Wilms, 1298; MacLea in Herb. Bolus, 3020.
L. hoepfnerianus Vatke. Vereeniging, Leslie.
L. similis C. H. Wright. Warmbaths, Sept., Miss Leendertz, 1314.
L. Wilmsii C. H. Wright. Near the Vaal River, Wilms, 1299; near Crocodile River, Wilms, 1299 b.
Arthrosolen polycephalus C. A. Mey. Sterkstroom River, Burke, 517; Bloemhof, July, Barrett-Hamilton, T.M.H. 6410.
A. sericocephala Meisn. Various localities.
A. variabilis C. H. Wright. Various localities.
Gnidia fastigiata Rendle var. *hirsuta* Pearson. Johannesburg, Rand, 899.
G. linoides Wikstr. Pretoria, Burt-Davy, 685; Rustenburg, Miss Pegler, 977.
G. ovalifolia Meisn. Macmac, Mudd.
G. pinifolia L. Magaliesberg, Burke.

LYTHRACEAE.

- Ammannia salsuginosa* Guill. and Perr. Magalaguena River, April, Schlechter, 4771; Komati Poort, April, Rogers, T.M.H. 4795; Swaziland, Sept., Miss Stewart, T.M.H. 10,650; Nelspruit, Dec., Dr Breyer, T.M.H. 17,712.
Nesaea sagittifolia (Sond.) var. *glabrescens*. Transvaal, Rehmann, 6796.

MYRTACEAE.

- Eugenia pusilla* N.E.Br. Near Amsterdam (E.), Forbes.

MELASTOMACEAE.

- Dissotis princeps* Triana. New Agatha, June, Rogers, 18,890.

HALORHAGIDACEAE.

Serpicula repens L. Haenertsburg, Nov., Mrs Pott, 4759.

UMBELLIFERAE.

Alepidea basinuda Pott. Woodbush, Nov., Jenkins, T.M.H. 7443; Haenertsburg, Nov., Mrs Pott, 4656.

A. comosa Dümml. Modderfontein, Conrath, 321.

A. Jacobsziae Dümml. Lijdenburg, April, Jenkins, T.M.H. 10,331.

A. Jenkinsii Pott. Middelburg, Nov., Jenkins, T.M.H. 9858.

A. longeciliata Schinz. Between Middelburg and Crocodile River, Wilms, 567; Carolina, Nov., Rademacher, T.M.H. 8197.

Bupleurum Mundtii Cham. and Schl. Zeerust, March, Jenkins, T.M.H. 11,662; Waterval Boven, June, Rogers; Crocodile River, Dec., Schlechter, 3917.

OLEACEAE.

Jasminum transvaalense Sp. Moore. Modjadjes (Ptbg.), Rogers, 18,108.

ASCLEPIADACEAE.

Raphionacme divaricata Harv. var. β . Various localities.

Tacazzea apiculata Oliv. var. *benedicta*. Komati Poort, Nov., Rogers, 12,633.

Schizoglossum cordifolium E. Mey. Haenertsburg, Nov., Mrs Pott, 4650; Tzaneen, Nov., Rogers, 12,480.

S. robustum Schltr. var. *pubiflorum* N.E.Br. Godwan River, Feb., Jenkins, T.M.H. 10,399; Spitskop (E.), Jan., Scheepers, T.M.H. 15,046; Pretoria, Jan., Miss Collins, T.M.H. 12,658.

Pachycarpus macrochilus N.E.Br. Goede Hoop (E.), Dec., Mrs Pott, 4895.

P. plicatus N.E.Br. Spitskop (E.), Dec., Mrs Pott, 5241.

Sisyranthus imbertis Harv. Haenertsburg, Nov., Mrs Pott, 4649; Mavriestad, Nov., Mrs Pott, 4901.

Ceropegia multiflora Baker, var. *latifolia* N.E.Br. Pretoria, Jan., March, Mrs Pott, 4740, 4825.

C. Thornecroftii N.E.Br. Barberton, Thornecroft; Kaap Valley, March, J. Thornecroft, T.M.H. 11,359.

Tavareia Barklyi N.E.Br. var. *grandiflora*. Louis Trichardt, Gettleffi, T.M.H. 11,459.

Huernia carnosa Stent. Zilikats Nek, Magaliesberg, Pole-Evans, 11,020 in U.D.A. Herbarium.

H. transvaalensis Stent. Crocodile River, Magaliesberg, Pole-Evans.

H. zebrina N.E.Br. Near Komati Poort, van Dam, T.M.H. 15,635.

Davalia polita N.E.Br. Zeerust, Jan., Mrs Pott, 4353.

D. transvaalensis Schltr. var. *parviflora* L. Bolus. Near Naboomspruit, Galpin, 8467.

Stapelia Gettleffii Pott. Louis Trichardt, Gettleffi, T.M.H. 9643.

CONVOLVULACEAE.

Dichondra repens Forst. Zeerust, Jan., Mrs Pott, 4170; Wolhuterskop, Nov., Miss Nunns, T.M.H. 18,772; Spelonken, Feb., Junod, 38.

Ipomoea bathycolpos Hall. var. *sinuato-dentata*. Lijdenburg, Jan., Wilms, T.M.H. 5808; Geelhoutkop (Wg.), Jan., Dr Breyer, T.M.H. 17,799.

I. magnusiana Schinz. Various localities.

I. palmata Forsk. Waterval Boven, Nov., Rogers, 18,512; Blauwkop (Z.), Aug. Dr Breyer, T.M.H. 16,035.

Jacquemontia capitata G. Don. Barberton, Dec., Mrs Pott, 5476; Lomato River, April, Jenkins, T.M.H. 9913.

Merremia angustifolia Hook. f. Various localities.

M. pinnata Hall. f. Nelspruit, Oct., Dr Breyer, T.M.H. 17,704.

BORAGINEAE.

Heliotropium zeylanicum Lam. Lekker Kraal, Jan., Krantz, T.M.H. 6421; Spelonken, Sept., Jenkins, T.M.H. 8157; Swaziland, July, Miss Stewart, T.M.H. 8814; Great Letaba, June, Dr Breyer, T.M.H. 17,576; Ngelelle (Z.), July, Dr Breyer, T.M.H. 16,038.

VERBENACEAE.

- Lantana Camara* L. Pretoria, Oct., Mrs Pott, 5710.
Vitex mooliensis Pearson var. *Rudolphi*. Barberton, Dec., Mrs Pott, 5683; Nelspruit, Oct., Dr Breyer, T.M.H. 18,350.
V. harveyana Pearson. Komati Poort, Nov., Rogers, T.M.H. 13,278.

LABIATAE.

- Plectranthus Thorncroftii* Sp. Moore. Barberton, J. Thorncroft, Herb. Rogers, 16,987.
Thorncroftia longiflora N.E.Br. Joes Luck, near Barberton, April, Thorncroft, 795.
Leucas glabrata R.Br. Various localities.
Salvia africana L. Pilgrim's Rest, July, Rogers.

SOLANACEAE.

- Solanum bifurcum* Hochst. Haenertsburg, Nov., Mrs Pott, 4498.
S. aculeastrum Dun. Haenertsburg, Nov., Mrs Pott, 4653.
S. nodiflorum Jacq. Barberton, Oct., Thorncroft, 1043.

SCROPHULARIACEAE.

- Harveya crispula* Conrath. Irene, Conrath, 966.
Sphenandra viscosa Bth. of first List is a synonym of *Sutera caerulea* Hiern.

BIGNONIACEAE.

- Markhamia acuminata* K. Schum. Messina, March, Rogers, 20,767.

PEDALIACEAE.

- Sesamum alatum* Thonn. Swaziland, July, Miss Stewart, T.M.H. 8819; Nelspruit, Nov., Rogers, T.M.H. 3036; Messina, March, Rogers, 20,848.
Sesamothamnus Lugardii N.E.Br. Messina, Dec., Rogers, 22,116.

GESNERACEAE.

- Streptocarpus pusillus* Harv. Volksrust, Jan., Jenkins, T.M.H. 9311; Belfast, Dec., Miss Leendertz, 2679; Mavieriestad (E.), Nov., Mrs Pott, 5005; Barberton, Dec., Mrs Pott, 5456.
S. denticulata Turrill. Barberton, Feb., Thorncroft, T.M.H. 18,283.

ACANTHACEAE.

- Thunbergia dregeana* Nees. Nelspruit, Feb., Dr Breyer, T.M.H. 17,895.
Hygrophila Rehmannii Schinz. Between Elandsriver and Klippan, Rehmann, 5056.
Dyschoriste Rogersii Sp. Moore. Transvaal, Rogers, 12,876.
Crabbea pedunculata N.E.Br. Waterval Boven, Nov., Rogers, 18,509.
C. velutina Sp. Moore. Vygeboomspruit (Z.), June, Dr Breyer, T.M.H. 18,658.
Blepharis Clarkei Schinz. Blauwberg, March, Schlechter, 4657; Warmbaths, Jan. Miss Leendertz, 2048; Majuba's Kloof (Ptbg.), Nov., Mrs Pott, 4776.
B. transvaalensis Schinz. Blauwberg, March, Schlechter, 4655; Rooiplaat (Pr), March, Miss Leendertz, 784.
Crossandra subacaulis C.B.Cl. Tzaneen, Nov., Rogers, 12,583.
Anisotes Rogersiae Sp. Moore. Messina, Rogers, 19,349.
A. sessiliflorus C.B.Cl. Between Ngelelle and Nuanetsi, July, Dr Breyer, T.M.H. 16,082; Messina, March, Rogers, 20,842.
Dicliptera zeylanica Nees. Harmony Block (Ptg.), July, Dr Breyer, T.M.H. 17,568.
Disperma transvaalense C.B.Cl. Elandsriver, Rehmann, 4892.
Ecobolium nearest *E. amplexicaule*. Komati Poort, Jan., Rogers, 22,488.
Monechma Welwitschii C.B.Cl. Messina, March, Rogers, 20,843.
Rhinacanthus spec. Messina, Feb., Rogers, 22,599.

RUBIACEAE.

- Oldenlandia macrophylla* DC. Haenertsburg, Nov., Mrs Pott, 4818; Komati Poort, Nov., Rogers, T.M.H. 13,287; Nelspruit, Dec., Dr Breyer, T.M.H. 17,720.
Gardenia resiniflua Hiern. Messina, Aug., March, Rogers, 19,489, 20,181.
Tricalysia floribunda (Harv.) K. Schum. Komati Poort, Nov., Rogers, T.M.H. 13,284.
T. bracteata Hiern. Waterpoort (Z.), Sept., Rogers.

Pachystigma pygmaea Schltr. Is *Vangueria pygmaea* Schltr. of first List.
Pavetta assimilis Sond. Various localities.
Spermacoce natalensis Hochst. Various localities.

DIPSACEAE.

Cephalaria attenuata R. and S. var. β . Standerton, Jan., Mrs Pott, 4052; Onderstepoort, Feb., ex Theiler's Lab.; Messina, March, Rogers, 20,862.
Scabiosa transvaalensis Sp. Moore. Pilgrim's Rest, Dec., Rogers, 14,361, 14,999; Spitskop, Wilms, 619.

CUCURBITACEAE.

Melothria acutifolia Cogn. Elandsriver, Rehmann, 4904, 4905.
Cucumis africanus L. var. *acutifolius* Cogn. Transvaal, Rehmann, 5169, 6311.
C. hirsutus Sond. var. *dissectus* Cogn. Transvaal, Rehmann, 6310.
Trochomeria Hookeri Harv. var. *quinquepartita* Cogn. Transvaal, Rehmann, 6304.
T. pectinata Cogn. var. *subintegriifolia* Cogn. Transvaal, Rehmann, 6309.
Corrallocarpus sphaerocarpus Cogn. β , *scaberrimus* Cogn. Boschveld, Rehmann, 4953, 5170.
C. sphaerocarpus Cogn. γ , *subhastatus* Cogn. Klippan, Rehmann, 5160.
Raphanocarpus spec. Griffin Mine (Z.), Jan., Dr Breyer, T.M.H. 19,725.

CAMPANULACEAE.

Wahlenbergia multiflora Conrath. Modderfontein, Conrath, 563.
W. gracillima Sp. Moore. On the Selati River, between Komati Poort and Letaba River, Rogers, 2684.
Cyphia Rogersii Sp. Moore. Modjadjes (Ptbg.), Rogers, 18,212.

COMPOSITAE.

Erlangea spec. Hlatikulu (Sw.), May, Miss Stewart, T.M.H. 12,872; The Downs (Ptbg.), Nov., Rogers, 21,932.
Vernonia cineria Less. The Downs (Ptbg.), July, Rogers, 20,115.
V. crataegifolia Hutch. Barberton, Galpin, 1350; Lijdenburg, April, Jenkins, T.M.H. 10,329.
V. dregeana Sch. Bip. Nooit Gedacht (E.), Dec., Mrs Pott, 4880; Piet Retief, Oct., Miss Collins, T.M.H. 13,950.
V. glabra Vatke. Various localities.
V. mespilifolia Less. Barberton, Dec., Thorncroft, T.M.H. 9609; Hlatikulu (Sw.), March, Miss Stewart, T.M.H. 9632.
V. pinifolia Less. Piet Retief, Dec., Jenkins, T.M.H. 10,950; Volksrust, Jan., Jenkins, T.M.H. 11,036.
V. primulina Hoffm. Harmony Block (Ptbg.), June, Dr Breyer, T.M.H. 17,566.
V. Randii Sp. Moore. Various localities.
V. Schlechteri O. Hoffm. Lijdenburg, Aug., Wilms.
Dichrocephala latifolia DC. Lijdenburg, April, Wilms, T.M.H. 6446.
Felicia elongatus Thb. var. Messina, March, Rogers, 20,752.
F. lutea N.E.Br. Various localities.
Psiadia arabica J. and Sh. Messina, Rogers, 20,002.
Nidorella depauperata Harv. Various localities.
N. hirta DC. Lijdenburg, Jan., Wilms, T.M.H. 5804.
Conyza pinnatifida Less. Groenkloof (R.), Dec., van Dam, T.M.H. 12,003.
Blumea aurita DC. Ngelele River (Z.), July, Dr Breyer, T.M.H. 16,089.
Helichrysum epapposum Bolus. 'Mpone Berg, March, Schlechter, 4735.
H. eriophorum Conrath. Irene, Conrath, 432.
H. floccosum Klatt. Various localities.
H. steneopteron DC. Various localities.
H. umbraculigerum Less. Houtboschberg, March, Schlechter, 4733; Shilovane, Junod, 2340; Pilgrim's Rest, April, Rogers, 18,554.
H. undatum Less. Various localities.
Anaglypha latifolia Sp. Moore. Pilgrim's Rest, Dec., Rogers, 14,319.
Pentatricha alata Sp. Moore. Pilgrim's Rest, Rogers, 18,667.
Monactinocephalus paniculatus Klatt. Houtbosch, Rehmann, 6068.
Pegolettia senegalensis Cass. Great Letaba, June, Dr Breyer, T.M.H. 18,661.

- Calostephane divaricata* Benth. Nuanetsi River, July, Dr Breyer, T.M.H. 16,053;
 Silwane's location (Ptbg.), July, Dr Breyer, T.M.H. 17,567.
Gegeria acaulis Benth. and Hook. Messina, Dec., Rogers, 22,265.
G. aspera Harv. Various localities.
Eclipta erecta L. Komati Poort, June, Rogers, T.M.H. 2345.
Coreopsis Steppia Steetz. The Downs (Ptbg.), July, Rogers, 20,104.
Thelesperma scabiosoides Less. Vereeniging, Nov., Mrs Pott, 3841.
Lasiospermum radiatum Trev. Vereeniging, Nov., Mrs Pott, 3882.
Matricaria multiflora Fzl. Sabie, Nov., Rogers, 18,604.
M. nigellaefolia DC. Nuanetsi River (Z.), July, Dr Breyer, T.M.H. 16,059.
M. pilifera Thell. Elandspruitbergen, Schlechter, 3846.
Schistostephium saxicola Hutch. Johsburg, Gilfillan in Herb. Galpin, 6218; Modderfontein, Conrath, 402; Houtbosch, Rehmann, 6082.
S. villosum Hutch. Swaziland, Hlatikulu, Miss Stewart, 77.
Brachymeris athanasioides Hutch. Is Pentzia athanasioides S. Moore of first List.
B. montana Hutch. Various localities.
Lopholaena segmentata Sp. Moore. Lijdenburg, Jan., Wilms, T.M.H. 10,770;
 Barberton, Jan., J. Thorncroft, T.M.H. 3962; Spitskop (E.), Dec., Mrs Pott, 5017.
Cineraria lyrata DC. Standerton, Jan., Mrs Pott, 4076; Vereeniging, Nov., Mrs Pott, 3850.
C. canescens Wendl. var. Standerton, Jan., Mrs Pott.
Senecio Conrathii N.E.Br. Modderfontein, Conrath, 1202.
S. isatideus DC. Lijdenburg, March, Wilms, T.M.H. 10,769; Zeerust, Jan., Mrs Pott, 4395; Spitskop (E.), Dec., Mrs Pott, 4876; Germiston, Nov., Rogers, 12,197.
S. Johannesburgensis Sp. Moore var. *dentatus* Volksrust, Rogers, 19,007.
S. latissimifolius Sp. Moore. Pilgrim's Rest, Rogers, 14,946.
S. macrophyllus Phillips. Houtbosch, Feb., Bolus, 10,993; Lijdenburg, Dec., Schlechter, 3956.
S. Ommannei Sp. Moore. Johannesburg, Ommanney, 111.
S. oxyriaefolius DC. The Downs (Ptbg.), Nov., Rogers, 21,906.
S. panduraefolius Harv. Hlatikulu (Sw.), March, Miss Stewart, T.M.H. 10,090;
 Lijdenburg, Nov., Wilms, T.M.H. 6468; Shilovane, April, Junod, T.M.H. 5282;
 Sabie, March, Rogers, 18,649.
S. pinnulatus Thunb. Various localities.
S. rhomboideus Harv. Spitskop (E.), Dec., Mrs Pott, 4875.
S. subcoriaceus Schltr. Bethal, Dec., Mrs Pott, 3658.
S. thyrsoideus DC. Graskop, Oct., Thorncroft, 979.
S. urophyllus Conrath. Modderfontein, Conrath, 1202.
S. vimineus DC. Potgietersrust, Oct., Miss Leendertz, 1235.
Dimorphotheca caulescens Harv. Various localities.
Tripteris auriculata Sp. Moore. The Downs (Ptbg.), Rogers, 20,243.
Ursinia natalensis N.E.Br. Barberton, Jan., J. Thorncroft, T.M.H. 2830; Hlatikulu (Sw.), Nov., Miss Stewart, T.M.H. 9561.
Venedium Bellidiastrum Sp. Moore. Standerton, Rogers, 18,758.
Berkheyopsis Rehmannii Thell. Between Elandsriver and Klippan, Rehmann, 5078;
 Elandsriver, Rehmann, 4962; Makapansbergen, Streydpoort, Rehmann, 5453.
Berkheya cousinoides Sp. Moore. Lijdenburg, Rogers, 14,546.
B. polyacantha Sp. Moore. Standerton, Rogers, 18,459.
Carduus pycnocephalus L. Volksrust, Jan., Jenkins, T.M.H. 9932.
Gerbera speciosa Sp. Moore. Pilgrim's Rest, Dec., Rogers, 14,322.
G. natalensis Sch. Bip. of first List is a synonym of *G. viridifolia* Sch. Bip.

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ANNALS

MEDEDELINGEN

OF THE

VAN HET

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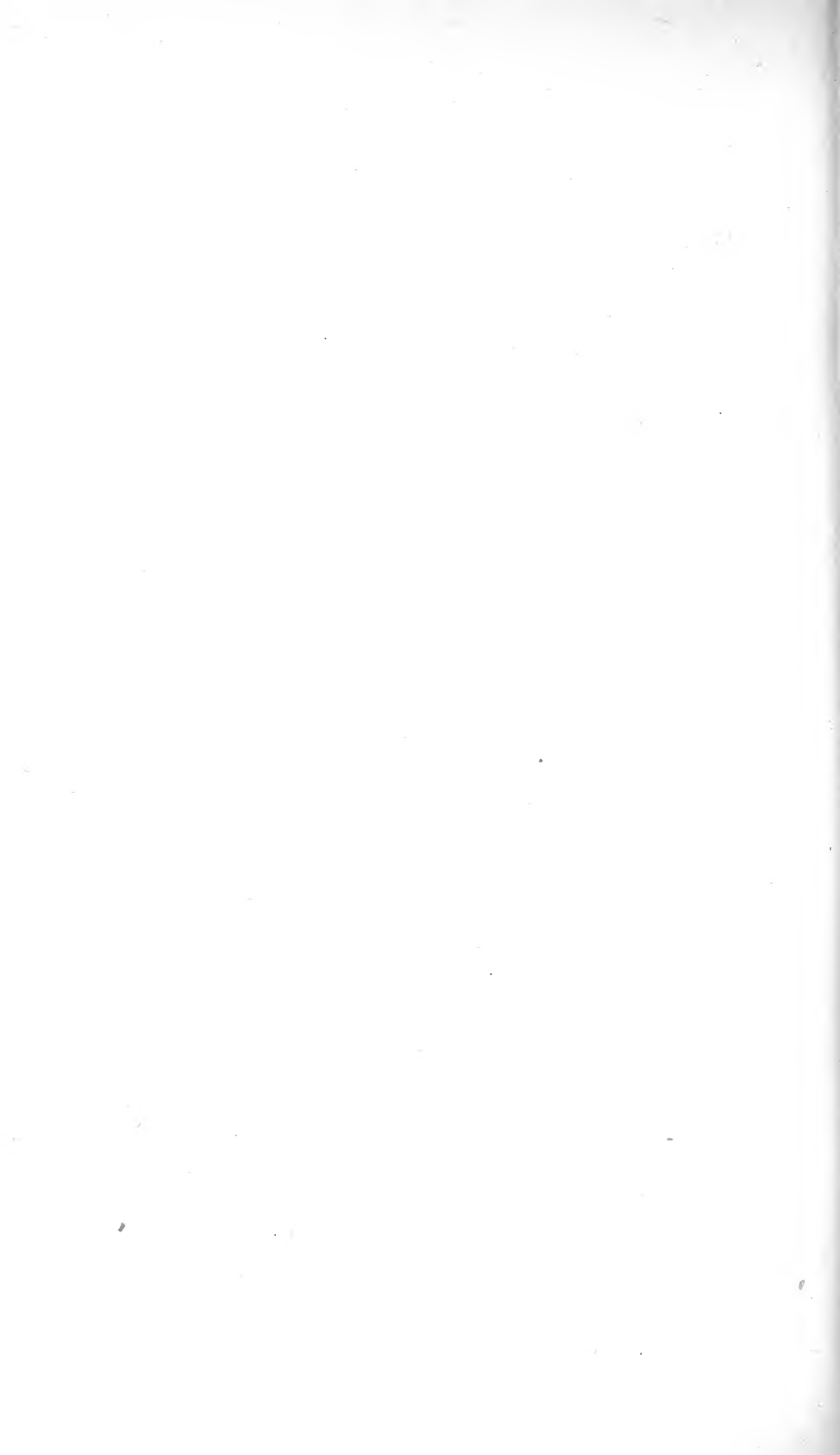
VOLUME VII



Printed for the

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BY THE UNIVERSITY PRESS,
CAMBRIDGE, ENGLAND

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PRINTED IN GREAT BRITAIN

LIST OF CONTENTS

VOLUME VII

	PAGE
DAM, G. P. F. VAN	
Descriptions of New Species of <i>Zonurus</i> and Notes on the Species of <i>Zonurus</i> occurring in the Transvaal. (4 Plates)	239
Description of a New Variety of a South African Lizard of the Family Geckonidae. (1 Plate)	244
GROBBELAAR, C. S.	
The Scolopendridae of South Africa. (28 Text-figures)	245
HEWITT, JOHN	
A Short Survey of the Solifugae of South Africa. (8 Plates and 14 Text-figures)	1
HOEPEN, E. C. N. VAN	
Contributions to the Knowledge of the Reptiles of the Karroo Formation:	
5. A New Dinosaur from the Stormberg Beds. (2 Plates and 6 Text-figures)	77
6. Further Dinosaurian Material in the Transvaal Museum. (13 Plates and 27 Text-figures)	93
Descriptions of some Cretaceous Ammonites from Pondoland. (3 Plates)	142
JANSE, A. J. T.	
On the South African Notodontidae, with Descriptions of apparently New Genera and Species. (14 Plates)	149
WAGNER, PERCY A.	
Note on a Relic of the Phallus Cult among the M'Kahtla. (1 Plate)	262

INDEX TO VOLUME VII

(New genera, subgenera, species, subspecies, and the main reference in a series of references in heavy-faced type; synonyms are in italics.)

- aemilianus, *Holcodiscus*, 146, 147
Aetonyx, 117, 118, 137
 palustris, 117, 137
 afra, *Rhysida*, 249 (Figs. 5, 6), 250 (Fig. 7), 251, 252 (Figs. 8, 9, 11, 12)
 africana, *Henicops*, 245, 260
 africanus, *Gryponyx*, 87, 101, 102, 103, 118
africanus, *Holcodiscus*, 146; Pl. XXVI, figs. 3-5
 agramma, *Phyllaliodes*, 192; Pl. I, figs. 22-24; Pl. IV, figs. 18-19
 Stauropus, 191
 ajax, *Pachysaurus*, 102, 136
 albicans, *Pseudorethona*, 168, **169**; Pl. I, fig. 9; Pl. III, figs. 1-6
 Rethona, 169
 albicostata, *Scalmicauda*, 158, 159, **160**; Pl. I, fig. 1; Pl. II, figs. 1-5
 albida, *Antheua*, 176, 178
 alcornis, *Solpuga*, 14, 18, **32, 48**; Pl. VII, fig. 34
 Alipes, 245, 246, **247**
 appendiculatus, 248
 calcipes, 248
 crotalus, 247 (Figs. 1-2)
 grandidieri, 248
 multicostia, 248
 ALIPINAE, 245
 alnifolia, *Trimeria*, 163, 170
 alstoni, *Solpuga*, 31, 47
amapondense, *Gaudryceras*, 143; Pl. XXIV, figs. 4-5
 Ammonites, 142
 Ammosaurus, 91, 92
 Amyops, 151, 152, 155, 205, **206**
 gigas, 206, 207; Pl. V, figs. 11-14; Pl. VII, figs. 18-19
 ingens, 206, 207
 Anaphe, 151, 153, 155, **232, 234**
 panda, 233
 reticulata, 232, 233; Pl. XI, figs. 9-16; Pl. XII, fig. 1
 anastomosis, *Ichthyura*, 161
 anceps, *Cormocephalus*, 256
 ANCHISAUROIDAE, 80, 91, 92, 102
 Anchisaurus, 91, 92
 solus, 92
 angolensis, *Rana*, 18
 anodonta, *Zana*, 221, **222**; Pl. V, fig. 22
 Antheua, 150, 151, 152 ftn., 153, 155 ftn., 157, **175**, 196, 198, 201, 221, 222
 Antheua, albida, 176, 178
 aurifodinae, 176, 177, 179; Pl. III, figs. 27-30
 basipuncta, 176, 178
 bicolor, 175, 176, 180, 235; Pl. I, fig. 20; Pl. III, figs. 24-25
 consanguinea, 177, 180
 croceipuncta, 176, 177, 178; Pl. I, fig. 19; Pl. III, figs. 19-23
 dimorpha, 155 ftn., 177, 180; Pl. I, fig. 25; Pl. IV, figs. 14-17; Pl. XIII, fig. 10
 dimorpha var. *brunnea*, 181; Pl. XIV, fig. 1
 encausta, 176, 177, 179; Pl. III, figs. 16-18
 extenuata, 176
 mixta, 176, 182; Pl. XIII, fig. 9
 peringueyi, 176, 182
 simplex, 157, 175, 176, 177; Pl. I, fig. 18; Pl. III, fig. 26
 tricolor, 175, 176, 177, 178, 179; Pl. I, fig. 7; Pl. III, figs. 10-15
 varia, 179
 Antheua, 176, 183, 222
 Anticyra, 179, 180
 antiquus, *Thecodontosaurus*, 91, 92
 apiculatum, *Combretum*, 186
 appendiculatus, *Alipes*, 248
Arctiomorpha, 232, 233
 argenteomaculata, *Scalmicauda*, 161
 argentescens, *Cerura*, 171, 171 ftn.
 aristata, *Chaetacme*, 202
 Aristosaurus, 82, 84, 85, 86, 90, 92
 erectus, 77, 78 (Fig. 1), 82 (Fig. 2), 84 (Fig. 3), 85 (Fig. 4), 86 (Fig. 5), 90 (Fig. 6), 92; Pls. IX-X
 Arthrorhabdus, 253, 259
 formosus, 259 (Fig. 24)
 pygmaeus, 259
 Asanada, 251, 253
 socotrana, 253 (Figs. 13-14)
 Asteroscopus, 235
Atrasana, 203, 205, 235
 atribasalis, *Stauropus*, 191
 atrifrons, *Scrancia*, **211**
 atriguttata, *Desmeocraera*, 184, **186**; Pl. IV, fig. 8
 Stauropus, 186
 aurifodinae, *Antheua*, 175, 176, 177, **179**, 198; Pl. III, figs. 27-30
 Rigema, 179

- austerus, Solpuga, 17
 australis, Gluviopsis, 61

 barberi, Chelypus, 70, 72
barbertonensis, **Zonurus**, 240; Pl. III
 basalis, Desmeocraera, 185, 186
 basipuncta, Antheua, 176, 178
 bechuanica, Solpuga, 14, 15, 39, 41, 51;
 Pl. IV, fig. 14
 bengalica, Scalmicauda, 158
 bernhardi, Daesia, 53
 betschuanica, Daesia, 54, 56
 bicolor, Antheua, 176, 180, 235; Pl. I,
 fig. 20; Pl. III, figs. 24-25
Chadistra, 180
bifasciata, **Cerura**, 171; Pl. XIII, fig. 8
 bipars, Chadistra, 200
 Blossia, 3, 5 (Text-fig. 1), 6, 9, 10, 12, 19,
 22, 56, 59
 clunigera, 59, 60
 crepidulifera, 57, 60
 echinata, 58, 59
 falcicornis, 9
 falcifera, 9, 57, 58 (Fig. 10a), 60
 falcifera, dolichognathus, 58
 falicornis, 9, 58, 59, 60
 fimbriata, 58, 61
 karrooica, 57, 59
 laminicornis, 57, 61
 laticosta, 59, 60
 litoralis, 57, 60
 maraisi, 58, 59
 namaquensis, 56, 61
 obscura, 22, 59
 setifera, 56, 57, 59
 tricolor, 58, 60
 unguicornis, 19, 56, 60; Pl. VII, figs.
 39-40; Pl. VIII, figs. 44, 46
 bouvieri, Hemiblossia, 61
 Brachionycha, 235
 punctulata, 235
 Brachystegia, 160 ftn., 227
 randii, 160 ftn., 227
 bracteolata, Trema, 202
 braunsi, Melanoblossia, 62
 brevicornis, Cormocephalus, 257
 brevipalpis, Solpuga, 17, 43
Breyeri, **Zonurus**, 239, 241; Pls. I, II
Breyeria, 151, 153, 157, 213
 dasychiroides, 213, 214; Pl. V, fig. 16;
 Pl. VIII, figs. 20-25; Pl. XIV, fig. 10
Broomiella, 7, 54
 tineata, 54
 Browni, Euskelesaurus, 100, 101
 Massospondylus, 103, 118, 122 (Text-
 fig. 22), 123 (Text-figs. 23-24), 124
 (Text-fig. 25), 125 (Text-fig. 26),
 126 (Text-fig. 27)
 Thecodontosaurus, 117, 118, 138
brunnea, **Antheua dimorpha**, 181; Pl.
 XIV, fig. 1

brunnea, **Eurystaura**, 216; Pl. IX, figs.
 5-9; Pl. XIV, fig. 11
 bucephala, Phalera, 195, 196
 buddhaicus, Holcodiscus, 146, 147

 caffra, Solpuga, 43
 calcaratus, Cormocephalus, 256 (Fig. 20),
 257
 calcipes, Alipes, 248
 calliope, Desmeocraera, 184, 186; Pl. IV,
 figs. 4 and 5
Stauropus, 186
 camolina, Lophopteryx, 166
Campyloctys, 151, 153, 158, 219
 gladstonei, 219, 220; Pl. V, fig. 20; Pl.
 X, figs. 1-7; Pl. XIV, fig. 13
canescens, **Desmeocraera**, 185, 188; Pl.
 XIII, fig. 14
 capensis, Euskelesaurus, 136, 137
 Pachydactylus, 244
 Scutigera, 245
 Toreus, 63
 Zonurus, 242
 carinatus, Massospondylus, 91, 116, 117,
 137, 138
 catocaloides, Catochria, 235
 Catochria, 235
 catocaloides, 235
 celeripes, Solpuga, 18, 31, 43, 47; Pl. VI,
 fig. 32
 Ceroma, 10, 19, 23, 63, 64
 focki, 64
 inermis, 63, 65
 leppanae, 64
 pallidum, 63, 64
 pictulum, 63 (Text-fig. 11), 64, 65; Pl.
 V, fig. 20
 sclateri, 63, 65
 Cerura, 150, 151, 155, 168, 169, 170,
 171 ftn., 173, 174
 argentescens, 171
 bifasciata, 171; Pl. XIII, fig. 8
 esmeralda, 171, 172
 furcula, 170
 marshalli, 171, 173
 spiritalis, 170, 171, 172, 173; Pl. I, fig.
 10; Pl. III, figs. 7-9; Pl. V, figs.
 1-3
 swierstrae, 170 ftn., 171, 173
 cervina, Solpuga, 14, 15, 18, 32, 48
Chadistra, 180
 Chadistra, 150, 151, 152, 153, 155, 155 ftn.,
 157, 180, 200, 213
 bipars, 200
 curvilinea, 200, 201; Pl. V, fig. 9; Pl.
 VI, figs. 26-28; Pl. VII, figs. 1-6
 persimilis, 201, 202
 rosinaria, 201, 202; Pl. VI, fig. 26
 semiflava, 201, 202
 uncifera, 201, 202
 Chaetacme, 202

- Chaetacme aristata*, 202
chelicornis, Solpuga, 8, 14, 16, 17, 20, 31, 38, 39, 41, 43, 51; Pl. III, fig. 11
Chelypus, 4, 6, 7, 18, 24, 64, 67, 68, 70, 72
 barberi, 70, 72
 hirsti, 70, 71 (Text-fig. 13), 72; Pl. VIII, fig. 45
 lennoxae, 70, 72
Chrysophyllum, 186
 natalense, 186
 viridifolium, 186
cinerea, **Taeniopteryx**, 212; Pl. VIII, figs. 14-19; Pl. XIV, fig. 9
clara, Epanaphe, 234
clarilla, Epanaphe, 234; Pl. XII, figs. 9-14
Cleapa, 177
clunigera, Blossia, 59, 60
collinita, Solpuga, 14, 18, 33, 48
Colobopleurus, 253, 259
 devylderi, 259, 260 (Figs. 25, 27)
 parcespinatus, 259, 260 (Figs. 26, 28)
Combretum, 186, 195
 apiculatum, 186
 guezinzii, 195, 204
concolor, **Hoplitis**, 203, 204; Pl. XIV, figs. 5, 6
congruata, **Phyctimorpha**, 208, 209; Pl. XIV, fig. 7
consanguinea, Antheua, 177, 180
coquinae, Solpuga, 35, 37, 50
cordata, Eugenia, 190
cordylus, Zonurus, 242, 243
Cormocephalus, 245, 253, 255
 anceps, 256
 brevicornis, 257
 calcaratus, 256 (Fig. 20), 257
 dispar, 256
 elegans, 255, 257
 nitidus, 254 (Figs. 16-17), 255 (Figs. 18-19), 257
 oligoporus, 257
 pseudopunctatus, 257
 setiger, 255, 256
COSSIDAE, 215
Cossus, 215
Crambometra, 151, 153, 158, 218, 220
 derelicta, 218, 219, 220; Pl. V, fig. 19; Pl. IX, figs. 18-23; Pl. XIV, fig. 12
crassimanus, Solpuga, 17
crassus, *Hexisopus*, 69
crepidulifera, Blossia, 57, 60
croceipuncta, Antheua, 176, 178; Pl. I, fig. 19; Pl. III, figs. 19-23
crotalus, *Alipes*, 247 (Figs. 1-2)
CRYPTOPINAE, 245, 246
Cryptops, 245
cultrata, Solpuga, 38
cuneicornis, Solpuga, 52
 Zeriassa, 52, 53
curvilinea, *Chadisra*, 200, 201; Pl. V, fig. 9; Pl. VI, figs. 27-28; Pl. VII, figs. 1-6
 Hyperaeschra, 201
cylindrodon, *Thecodontosaurus*, 91
cymosa, *Dombeya*, 202
Dacetum, 245
Daesia, 7, 9, 10, 12, 19, 20, 22, 53, 55, 68, 71
 bernhardi, 53
 betschuanica, 54, 56
 hottentotta, 54, 56
 kolbei, 54
 leipoldti, 53, 54
 lineata, 9 (Text-fig. 1a), 53, 54, 55, 56; Pl. VI, figs. 27, 31; Pl. VIII, fig. 43
 namaqua, 54, 55
 pallida, 54
 pearsoni, 56
 rhodesiana, 55, 56
 schreineri, 7, 54, 55
 schultzei, 55, 56
 subulata, 53, 55
DAESIINAE, 10, 20, 22, 66, 68
darlingi, Solpuga, 31, 44, 47
dasychira, *Ramesa*, 223
dasychiroides, **Breyeria**, 213, 214; Pl. V, fig. 16; Pl. VIII, figs. 20-25; Pl. XIV, fig. 10
 Hoplitis, 203, 204; Pl. VII, figs. 7-12
Datana, 235
 ministra, 235
 ruficollis, 235
delalandi, *Rana*, 67
derbiana, Solpuga, 10, 11 (Text-fig. 1b, B, C), 14, 16, 17, 18, 19, 33, 34, 35 (Text-fig. 7), 37, 42, 50; Pl. II, fig. 4
derelicta, *Crambometra*, 218, 219; Pl. V, fig. 19; Pl. IX, figs. 18-23; Pl. XIV, fig. 12
Desmeocraera, 151, 152, 156, 183, 191, 194
 atriguttata, 184, 186; Pl. IV, fig. 8
 basalis, 185, 186
 calliope, 184, 186; Pl. IV, figs. 4 and 5
 canescens, 185, 188; Pl. XIII, fig. 14
 ianthina, 186
 incana, 185, 189
 interpellatrix, 183, 184, 185, 186; Pl. I, fig. 21; Pl. IV, figs. 1-3
 octoginta, 188
 pergrisea, 185, 191
 platti, 185, 190; Pl. XIII, fig. 16
 steniptera, 185, 191; Pl. IV, figs. 12 and 13
 thalassina, 184, 187; Pl. IV, fig. 9
 tripuncta, 184, 189; Pl. XIII, fig. 15
 varia, 185, 187; Pl. IV, fig. 7; Pl. XIII, figs. 11-13
 vernalis, 184, 185, 186, 187; Pl. IV, fig. 6

- Desmeocraera*, 173, 174, 184
hierax, 173, 174, 184
Desmodium, 178
incanum, 178
devylderii, *Colobopleurus*, 259, 260 (Figs. 25, 27)
dimorpha, *Antheua*, 155 ftn., 177, 180;
 Pl. I, fig. 25; Pl. IV, figs. 14-17; Pl. XIII, fig. 10; Pl. XIV, fig. 2
Dinara, 179
encausta, 179
discolor, *Mimusops*, 188, 191
dispar, *Cormocephalus*, 256
dissimilus, *Pararethona hierax*, 174
dolichognathus, *Blossia falcifera*, 58
 (Text-fig. 10b)
Dombeya, 202
cymosa, 202
Dromicosaurus, 94, 103, 130, 138, 140
gracilis, 94, 95 (Text-fig. 2), 103, 105
 (Text-figs. 8, 9), 106 (Text-figs. 10, 11), 107 (Text-fig. 12), 108 (Text-figs. 13, 14), 110 (Text-fig. 15), 111 (Text-fig. 16), 112 (Text-fig. 17), 113 (Text-fig. 18), 114 (Text-fig. 19), 115 (Text-fig. 20), 116 (Text-fig. 21), 118, 130, 132, 138; Pl. XIII, figs. 2-8; Pls. XIV-XVI
echinata, *Blossia*, 58, 59
Ekebergia, 195
meyeri, 195
elegans, *Cormocephalus*, 255, 257
elegans, *Leucophalera*, 199; Pl. V, fig. 8; Pl. VI, figs. 22-25; Pl. XIV, fig. 4
encausta, *Antheua*, 176, 177, 179; Pl. III, figs. 16-18
Dinara, 179
Epanaphe, 151, 154, 155, 234
clara, 234
clarilla, 234; Pl. XII, figs. 9-14
moloneyi, 234
ephippiata, *Sirenopyga*, 177
epigonum, *Tetragonites*, 144
erectus, *Aristosaurus*, 77, 78 (Fig. 1), 82 (Fig. 2), 84 (Fig. 3), 85 (Fig. 4), 86 (Fig. 5), 90 (Fig. 6), 92; Pls. IX-X
erlenbergiensis, *Plateosaurus*, 102, 136
erythronota, *Solpuga*, 17, 33, 34, 49
erythronotoides, *Solpuga*, 17, 33 (Text-fig. 6), 49
esmeralda, *Cerura*, 171, 172
Ethmostigmus, 245, 247, 248
trigonopodus, 248 (Figs. 3, 4)
Eucnemesaurus, 93, 99, 102, 116, 140
fortis, 93, 95 (Text-fig. 1), 96 (Text-figs. 3, 4), 97 (Text-fig. 5), 98 (Text-figs. 6, 7), 102, 118; Pls. XI; XII; XIII, fig. 1
Eucorybus, 245
Eugenia, 190
Eugenia cordata, 190
euprepiaeformis, *Arctiomorpha*, 233
Eurystaura, 151, 153, 158, 216
brunnea, 216; Pl. IX, figs. 5-9; Pl. XIV, fig. 11
Euskelesaurus, 100, 136, 137, 140
Browni, 100, 137
capensis, 136, 137
Eutimia, 183, 221, 222, 235
fagi, *Stauropus*, 194
Faku, *Holcodiscus*, 144; Pl. XXV, figs. 3, 4; Pl. XXVI, figs. 1, 2
falcicornis, *Blossia*, 9
falcifera, *Blossia*, 9, 57, 58 (Text-fig. 10a), 60
fasciata, *Rana*, 67
ferox, *Solpuga*, 13, 15, 18, 30, 31, 32
 (Text-fig. 5), 47
filicornis, *Blossia*, 9, 58, 59, 60
fimbriata, *Blossia*, 58, 61
flavida, *Pydna*, 228 ftn., 229
focki, *Ceroma*, 64
fodiens, *Hexisopos*, 6, 69
forbesianum, *Phylloceras*, 142
formosus, *Arthrorhabdus*, 259 (Fig. 24)
Pachydaetylus capensis, 244
fortis, *Eucnemesaurus*, 93, 95 (Text-fig. 1), 96 (Text-figs. 3, 4), 97 (Text-fig. 5), 98 (Text-figs. 6, 7), 102, 118; Pls. XI, XII; XIII, fig. 1
furcifera, *Solpuga*, 14, 18, 25, 45
furcula, *Cerura*, 170
fusca, *Solpuga*, 12, 26, 44; Pl. VI, fig. 26
fuscata, *Polienus*, 224, 225; Pl. XIV, fig. 15
fuscigula, *Rana*, 18
fuscinota, *Scalmicauda*, 159
Galeodes, 69
 GALEODIDAE, 20, 67, 68
Galona, 151, 152, 156, 157, 205
pyrrhotricha, 206
serena, 205, 206; Pl. V, fig. 10; Pl. VII, figs. 13-17
Gargetta, 211
Gaudryceras, 143
amapondense, 143; Pl. XXIV, figs. 4, 5
 GECKONIDAE, 244
 GEOPHILIDAE, 261
 GEOPHILUS, 261
giganteus, *Zonurus*, 240, 242
gigas, *Amyops*, 206, 207; Pl. V, figs. 11-14; Pl. VII, figs. 18, 19
Hoplitis, 207
Melebaeas, 207
glabrifrons, *Solpuga*, 17
gladstonei, *Campyloctys*, 219, 220; Pl. V, fig. 20; Pl. X, figs. 1-7; Pl. XIV, fig. 13
globiceps, *Melanoblossia*, 62

- globoicornis*, *Solpuga*, 11, 13, 18, 27, **30**,
46; Pl. V, fig. 21
gluviopsis, 19, 21 ftn., **23**, 61
australis, 61
gracilis, *Dromicosaurus*, 94, 95 (Text-
fig. 2), 98, **103**, 105 (Text-figs. 8, 9),
106 (Text-figs. 10, 11), 107 (Text-
fig. 12), 108 (Text-figs. 13, 14), 110
(Text-fig. 15), 111 (Text-fig. 16), 112
(Text-fig. 17), 113 (Text-fig. 18), 114
(Text-fig. 19), 115 (Text-fig. 20), 116
(Text-fig. 21), 118, 130, 132, 138; Pl.
XIII, figs. 2-8; Pls. XIV-XVI
grandidieri, *Alipes*, 248
Gresslyosaurus, 101, 102, 118, 140
Plieningeri, 118
robustus, 101, 102
Grewia, 170
lasiocarpa, 170
griseitincta, *Scalmicauda*, 159, 160
griseiviridis, *Stauropus*, 191
Gryponyx, 87, 101, 102, 118, 140
africanus, 87, 101, 102, 103, 118
transvaalensis, 102, 140
guezinzi, *Combretum*, 195, 204
Gyposaurus, 91

hamata, *Solpuga*, 14, 15, **39**, 51
HARPACTIRAE, 20
Harrisi, *Massospondylus*, 91, 102, 117,
136, 137
hastata, *Solpuga*, 12, 17, 42, 52
Hemiblossia, 5, 10, 19, **23**, 61, 62
bouvieri, 61
idioceras, 62
kalaharica, 62
O'neili, 19, 61, 62; Pl. III, fig. 5; Pl.
VIII, fig. 42
Hemicormocephalus, 251, 255
multispinus, 254 (Fig. 15), 255
Henicops, 245, 260
africana, 245, 260
Henosis, 232
heterogyna, *Scalmicauda*, **159**; Pl. I, fig. 2
Heterostoma, 245
HEXISOPODIDAE, 66
HEXISOPODINAE, 10, 20, 24, 68
Hexisopus, 5, 6, 10, 18, **24**, **66**, 71, 72
crassus, 69
fodiens, 6, 69
infuscatus, 69, 70
lanatus, 69, 71, 72; Pl. VIII, fig. 41
nigrolunatus, 69, 70
reticulatus, 69, 70
hierax, *Desmeocraera*, 173, 174, 184,
191
Pararethona, 171 ftn., **174**; Pl. I, figs.
11-16
hirsti, *Chelypus*, **70** (Text-fig. 13), 72;
Pl. VIII, fig. 45
hirta, *Protea*, 172

Holcodiscus, 144, 146
Aemilianus, 146, 147
africanus, 146; Pl. XXXVI, figs. 3-5
buddhaicus, 146, 147
Faku, 144; Pl. XXV, figs. 3-4; Pl.
XXXVI, figs. 1, 2
Kandi, 146, 147
karapadensis, 146, 147
madrasinis, 146, 147
Hoplitis, 151, 152, 156, **203**, 207, 235
concolor, 203, 204; Pl. XIV, figs. 5, 6
dasychiroides, 203, 204; Pl. VII, figs.
7-12
milhauseri, 203
phyllocampa, 203, 204
postica, 203, 204, 205
Hoplitis, 207
hostilis, *Solpuga*, 7, 8, 13, 14, 15, 16, 17,
18, 33, 36, 37, **38**, 39, 41, 42, 50; Pl.
IV, figs. 16, 17; Pl. VI, fig. 29
hottentotta, *Daesia*, **54**, 56
hyaenella, *Zophodiopsis*, 233
Hybocampa, 203
Hyperaeschra, 165, 201, 202
Hyperaeschra, 201
Hypophiala, 151, 152, 156, **192**
melanogramma, 192, 193; Pl. I, figs.
26, 27; Pl. IV, figs. 20-24; Pl. XIV,
fig. 3

ianthina, *Desmeocraera*, 186
Ichthyura, 150, 151, 155, **161**
anastomosis, 161
lentsignata, 162
rosocincta, 161, 162, 163; Pl. I, fig. 6;
Pl. II, figs. 6-10; Pl. XIII, fig. 4
violacearia, 162, 163; Pl. XIII, figs. 5, 6
idioceras, *Hemiblossia*, **62**
imitata, *Phalera*, 195, **196**; Pl. V, fig. 5;
Pl. VI, figs. 8-14
impedita, *Stenostaura*, **215**; Pl. V, fig. 17;
Pl. IX, figs. 1-4
impeditus, *Cossus*, 215
incana, *Desmeocraera*, 185, **189**
incanum, *Desmodium*, 178
inermis, *Ceroma*, 63, 65
infuscatus, *Hexisopus*, 69, 70
ingens, *Amyops*, 206, 207
Inous, 235
interpellatrix, *Desmeocraera*, 183, 184,
185, 186; Pl. I, fig. 21; Pl. IV, figs.
1-3
Stauropus, 185

jonesi, *Zonurus*, 243
junodi, *Solpuga*, 14, 15, 39, 48, 50

kafulica, *Solpuga niassa*, **73** (Text-fig.
14)
kalaharica, *Hemiblossia*, 62
Kandi, *Holcodiscus*, 146, 147

- karapadensis, *Holcodiscus*, 146, 147
 karrooica, *Blossia*, 57, 59
KARSCHIINAE, 20, 23, 68
 keyserlingi, *Solpuga*, 18
 kolbei, *Daesia*, 54

laminiornis, *Blossia*, 57, 61
lanatus, *Hexisopus*, 69, 70, 71, 72; Pl. VIII, fig. 41
lasiocarpa, *Grewia*, 170
lateralis, *Solpuga*, 17, 33, 34, 43, 49; Pl. V, fig. 24
laticosta, *Blossia*, 59, 60
latimanus, *Solpuga*, 17
leipoldti, *Daesia*, 53, 54
lennoxae, *Chelypus*, 70, 72
lentisignata, *Ichthyura*, 162
leppanae, *Ceroma*, 64
lethalis, *Solpuga*, 12, 13, 14, 18, 24, 25 (Text-fig. 2a), 26
Leucophalera, 151, 152, 157, 199
elegans, 199; Pl. V, fig. 8; Pl. VI, figs. 22-25; Pl. XIV, fig. 4
Leviseuri, *Pedeticosaurus*, 77
lignitea, *Phalera*, 196, 197
lignosa, *Zana*, 221
LIMACODIDAE, 169
lineata, *Broomiella*, 54
Daesia, 9 (Text-fig. 1a), 53, 54, 56; Pl. VI, figs. 27, 28, 31; Pl. VIII, fig. 43
Solpuga, 12, 17, 19, 42, 43, 52; Pl. III, fig. 7; Pl. VI, fig. 33
Lipophaga, 8, 18, 23, 65, 66 (Text-fig. 12)
michaelseni, 65
schultzei, 65
trispinosa, 65
LITHOBIIDAE, 245, 260
litoralis, *Blossia*, 57, 60
Lophopteryx, 150, 151, 158, 165, 166
camelina, 166
saturata, 166
uniformis, 166, 167; Pl. I, fig. 8; Pl. II, figs. 18-23
lydenburgi, *Phalera*, 195, 196, 197; Pl. V, fig. 6
LYMANTRIADAE, 150, 232

macer, *Solpuga*, 17
macrodonga, *Ramesa*, 222, 223; Pl. V, fig. 23; Pl. X, figs. 8-11
macrogathus, *Solpuga chelicornis*, 15, 41 (Text-fig. 9), 51
macropoda, *Tephrosia*, 181
madrasinus, *Holcodiscus*, 146, 147
magnus, *Pachysaurus*, 82
maraisi, *Blossia*, 58, 59
Solpuga, 17, 33, 49; Pl. V, fig. 23
marpissa, *Eutimia*, 183, 222, 235
Zana, 221, 222; Pl. V, fig. 21; Pl. IX, figs. 24-29

marshalli, *Cerura*, 171, 173
Solpuga, 14, 15, 16, 17, 36, 38, 39, 50; Pl. VI, fig. 30
Massospondylus, 91, 92, 102, 103, 116, 117, 118, 122, 123, 124, 125, 126, 136, 137, 138
Browni, 103, 118, 122 (Text-fig. 22), 123 (Text-figs. 23-24), 124 (Text-fig. 25), 125 (Text-fig. 26), 126 (Text-fig. 27); Pls. XVII-XXII
carinatus, 91, 116, 117, 137, 138
Harriesi, 91, 102, 117, 136, 137
mediata, *Ochrostigma*, 195
Stauropus, 194, 195; Pl. V, fig. 4; Pl. VI, figs. 1-7
Melanoblossia, 9, 18, 22, 62
braunsi, 62
globiceps, 62
melanogramma, *Hypophiala*, 192, 193; Pl. I, figs. 26, 27; Pl. IV, figs. 20-24; Pl. XIV, fig. 3
Melebaeas, 206, 207
methueni, *Solpuga*, 42, 52
meyeri, *Ekebergia*, 195
michaelseni, *Lipophaga*, 65
milhauseri, *Hoplitis*, 203
Mimusops, 186, 188, 191
discolor, 188, 191
obovata, 186, 188
ministra, *Datana*, 235
minor, *Thecodontosaurus*, 92
mixta, *Antheua*, 176, 182; Pl. XIII, fig. 9
modesta, *Scranca*, 210
modestus, *Polienus*, 223, 224; Pl. X, figs. 12-17
moloneyi, *Epanaphe*, 234
monteiroi, *Solpuga*, 16, 19, 26, 27, 28, 45; Pl. VII, fig. 38
morsitans, *Scolopendra*, 257 (Figs. 21-23), 258
multibracteata, *Protea*, 164, 172
multicostis, *Alipes*, 248
multispinus, *Hemicormocephalus*, 254 (Pl. 15), 255
MYRIAPODA, 245

namaqua, *Daesia*, 54, 55
namaquensis, *Blossia*, 56, 61
natalense, *Chrysophyllum*, 186
nera, *Phylloceras*, 142
Netria, 194
NEWPORTIIDAE, 245
niassa, *Solpuga*, 18, 73
nigrescens, *Solpuga*, 43
nigrobraccata, *Solpuga*, 43
nigrolunatus, *Hexisopus*, 69, 70
nigrosparza, *Polienus*, 156, 224, 225; Pl. XIV, fig. 14
nitidiceps, *Solpuga*, 17
nitidus, *Cormocephalus*, 254 (Figs. 16, 17), 255 (Figs. 18, 19), 257

- niveiplaga, Scalmicauda, 161
NOCTUIDAE, 235
noctuiformis, **Pectinophora**, 164, 165;
 Pl. I, fig. 7; Pl. II, figs. 11-17; Pl.
 XIII, fig. 7
NOTODONTIDAE, 149, 151, 155, 232,
 235
 Notoxantha, 151, 153, 157, 217
 sesamiodos, 217, 218; Pl. V, fig. 18;
 Pl. IX, figs. 10-17
 nubeculosa, Brachionycha, 235
 obovata, Mimusops, 186, 188
 obscura, Blossia, 22, 59
Ochrostigma, 195
 octoginta, Desmeocraera, 188
 Stauropus, 191
 oligoporus, Cormocephalus, 257
 O'neili, Hemiblossia, 19, 61, 62; Pl. III,
 fig. 5; Pl. VIII, fig. 42
O'Neili, **Prionocentrum**, 226; Pl. X,
 figs. 18-22; Pl. XI, fig. 1; Pl. XIV,
 fig. 16
Scalmicauda, 158, 159, 160; Pl. I,
 figs. 4, 5; Pl. XIII, figs. 1-3
 Opisthophthalmus, 17
orangicus, **Solpuga coquinae**, 37, 50
 ornata, Rigema, 197, 198; Pl. V, fig. 7; Pl.
 VI, figs. 15-21
 ornithorhyncha, Solpuga, 42, 52; Pl. V,
 fig. 19
Osica, 180, 235
verulama, 180, 235
OTOSTIGMINAE, 245, 246
 Otostigmus, 246
 Pachydactylus, 244
 capensis formosus, 244
 capensis tigrinus, 244; Pl. V
 Pachysaurus, 82, 102, 136
 ajax, 102, 136
 magnus, 82
 pallida, Daesia, 54
 pallidum, Ceroma, 63, 64
 palustris, Aetonyx, 117, 137
 panda, Anaphe, 233
Pararethona, 150, 151, 156, 171 ftn.,
 173, 184, 191
 hierax, 171 ftn., 174; Pl. I, figs. 11-16
 hierax dissimilis, 174
 parcespinatus, Colobopleurus, 259, 260
 (Figs. 26, 28)
 pearsoni, Daesia, 56
Pectinophora, 150, 151, 158, 164
 noctuiformis, 164, 165; Pl. I, fig. 7;
 Pl. II, figs. 11-17; Pl. XIII, fig. 7
 Pedeticosaurus, 77
 Leviseuri, 77
 pergrisea, Desmeocraera, 185, 191
Stauropus, 191
peringueyi, **Antheua**, 176, 182
 persimilis, Chadisra, 201, 202
 petersi, Rhysida, 250, 251, 252 (Fig. 10)
 Phalera, 151, 152, 157, 195, 198, 199
 bucephala, 195
 imitata, 195, 196; Pl. V, fig. 5; Pl. VI,
 figs. 8-14
 lignitea, 196, 197
 lydenburgi, 195, 196, 197; Pl. V, fig. 6
Phalera, 198
Phycitimorpha, 151, 153, 156, 158, 208,
 213
 congruata, 208, 209; Pl. XIV, fig. 7
 stigmatica, 208; Pl. VIII, figs. 1-5; Pl.
 XIV, fig. 8
 Phyllaliodes, 151, 152, 156, 192
 agramma, 192; Pl. I, figs. 22-24; Pl. IV,
 figs. 18, 19
 phyllocampa, Hoplitis, 203, 204
 Phylloceras, 142, 143
 Forbesianum, 142
 Nera, 142
 Rogersi, 143
 umzambiense, 142; Pl. XXIV, figs.
 1-3
 Velledae, 143
 picta, Solpuga, 12, 43
 pictulum, Ceroma, 63 (Text-fig. 11), 65;
 Pl. V, fig. 20
PLATEOSAUROIDAE, 80, 91, 92, 102,
 120, 135, 140
 Plateosaurus, 89, 101, 102, 116, 118, 135,
 136, 140
 erlenbergiensis, 102, 136
 poligniensis, 102
 Quenstedti, 118, 135, 136, 140
 Reinigeri, 89, 102, 135
 stormbergensis, 102, 116
platti, **Desmeocraera**, 185, 190; Pl.
 XIII, fig. 16
 Plieningeri, Gresslyosaurus, 118
plumitarus, **Polelassothys**, 229, 230
 Pl. XII, figs. 2-8; Pl. XIV, fig. 17
Polelassothys, 151, 153, 155, 229
 plumitarus, 229, 230; Pl. XII, figs.
 2-8; Pl. XIV, fig. 17
 Polienuus, 151, 153, 156, 223
 fuscata, 224, 225; Pl. XIV, fig. 15
 modestus, 223, 224; Pl. X, figs. 12-17
 nigrosparsa, 156, 224, 225; Pl. XIV,
 fig. 14
 poligniensis, Plateosaurus, 102
 poliostrata, Somera, 235
 postica, *Atrasana*, 204, 205, 235
 Hoplitis, 203, 204, 235
Prionocentrum, 151, 153, 157, 226
 O'neili, 226; Pl. X, figs. 18-22; Pl. XI,
 fig. 1; Pl. XIV, fig. 16
 Protea, 164, 172
 hirta, 172
 multibractea, 164, 172
 Pseudoblossia, 65

- pseudopunctatus, Cormocephalus, 257
Pseudorethona, 150, 151, 156, 168
 albicans, 168, 169, 173, 174; Pl. I, fig. 9; Pl. III, figs. 1-6
pubescens, Solpuga chelicornis, 40, 41, 42, 51; Pl. II, fig. 2
 pugalitor, Solpuga, 28
 punctulata, Brachionycha, 235
 purcelli, Zeriassa, 52, 53; Pl. VII, fig. 36
 Pydna, 151, 153, 156, 157, 228
 flavida, 228 ftn., 229
 rubrifascia, 153, 157, 228 ftn., 229; Pl. XI, fig. 3
 rubritincta, 156, 228, 229; Pl. XI, figs. 2, 4-8
 testacea, 228
 pygmaeus, Arthrorhabdus, 259
 pyrrhotricha, Galona, 206
- Quenstedti, Plateosaurus, 118, 135, 136, 140
- Ramesa, 151, 153, 157, 222
 dasychira, 223
 macrodonta, 222, 223; Pl. V, fig. 23; Pl. X, figs. 8-11
 tosta, 222
- Rana, 18, 67
 angolensis, 18
 delalandii, 67
 fasciata, 67
 fuscigula, 18
- randii, Brachystegia, 160 ftn., 227
rectus, Solpuga lethalis, 14, 18, 24, 25 (Text-fig. 2b), 44; Pl. VII, fig. 37
 Reinigeri, Plateosaurus, 89, 102, 135
Rethona, 169
 albicans, 169
 strigosa, 169
- reticulata, Anaphe, 232, 233; Pl. XI, figs. 9-16; Pl. XII, fig. 1
 reticulatus, Hexisopus, 69, 70
 Rhagodes, 68, 69 ftn.
 RHAGODINAE, 68
 rhodesiana, Daesia, 55, 56
 Solpuga, 73
- Rhus, 180
 villosa, 180
- Rhysida, 245, 247, 248, 252
 afra, 249 (Figs. 5, 6), 250 (Fig. 7), 251, 252 (Figs. 8, 9, 11, 12)
 petersi, 250, 251, 252 (Fig. 10)
- Rigema**, 179
 Rigema, 151, 152, 157, 179, 195, 196, 197
 ornata, 197, 198; Pl. V, fig. 7
 vittata, 197
 woerdeni, 198
- robertsi, Zonurus**, 241; Pl. IV
 robustus, Gresslyosaurus, 101, 102
 Rogersi, Phylloceras, 143
- roseotincta, Ichthyura**, 161, 162, 163; Pl. I, fig. 6; Pl. II, figs. 6-10; Pl. XIII, fig. 4
 rosinaria, Chadisra, 201, 202; Pl. VI, fig. 26
 rubrifascia, Pydna, 153, 157, 228 ftn., 229; Pl. XI, fig. 3
 rubritincta, Pydna, 156, 228, 229; Pl. XI, figs. 2, 4-8
rufescens, Solpuga chelicornis, 40, 41, 51; Pl. II, fig. 3
 ruficollis, Datana, 235
 rugosa, Scutigera, 245
- sagittaria, Solpuga, 18, 31, 47
 saturata, Lophopteryx, 166
 Sauropoda, 97
 Scalmicauda, 150, 151, 155, 158
 albicostata, 158, 159, 160; Pl. I, fig. 1; Pl. II, figs. 1-5
 argenteomaculata, 161
 bengal, 158
 fuscinota, 159
 griseitincta, 159, 160
 heterogyne, 159; Pl. I, fig. 2
 niveiplaga, 161
 O'neili, 158, 159, 160; Pl. I, figs. 4, 5; Pl. XIII, figs. 1-3
 schlechteri, Solpuga, 18, 27, 45; Pl. IV, fig. 15
 schönlandi, Solpuga, 13, 16, 18, 29 (Text-fig. 4), 46, 73
 schreineri, Daesia, 7, 54, 55
 schultzei, Daesia, 55, 56
 Lipophaga, 65
 Solpuga, 13, 43
 schweinfurthi, Solpuga, 18
 sclateri, Ceroma, 63, 65
 SCOLOCRYPTOPIDAE, 245
 Scolopendra, 245, 253, 257, 258
 morsitans, 257 (Figs. 21-23), 258
 SCOLOPENDRIDAE, 245, 246, 260
 SCOLOPENDRINAE, 245, 246, 251, 258
 scopulata, Solpuga, 43
 Scrancia, 151, 153, 156, 208, 210
 atrifrons, 211
 modesta, 210
 stictica, 210, 211; Pl. V, fig. 15; Pl. VIII, figs. 6-13
 Scutigera, 245
 capensis, 245
 rugosa, 245
 semiflava, Chadisra, 201, 202
 serena, Galona, 205, 206; Pl. V, fig. 10; Pl. VII, figs. 13-17
 sericea, Solpuga, 13, 16, 18, 31, 43, 44, 47; Pl. III, fig. 6
 serraticornis, Solpuga, 14, 18, 27, 46
 sesamiodes, Notoxantha, 217, 218; Pl. V, fig. 18; Pl. IX, figs. 10-17

- setifera, Blossia, 56, 57, 59
 setiger, Cormocephalus, 255, 256
 simplex, Antheua, 157, 175, 176, 177; Pl. I, fig. 18; Pl. III, fig. 26
Sirenopyga, 175, 177
 ephippiata, 177
 skriptopodus, Thecodontosaurus, 92, 117, 138
 socotrana, Asanada, 253 (Figs. 13, 14)
 SOLIFUGAE, 3, 4, 12, 19, 20, 21, 67, 69 ftn.
 Solpuga, 7, 8, 9, 10, 11, 12, 13, 18, 19, 21, 24, 43, 67, 71, 73
 alicornis, 14, 18, 32, 48; Pl. VII, fig. 34
 alstoni, 31, 47
 austerus, 17
 bechuanica, 14, 15, 39, 41, 51; Pl. IV, fig. 14
 brevipalpis, 17, 43
 caffra, 43
 celeripes, 18, 31, 43, 47; Pl. VI, fig. 32
 cervina, 14, 15, 18, 32, 48
 chelicornis, 8, 14, 16, 17, 20, 31, 38, 39, 41, 43, 51; Pl. III, fig. 11
 chelicornis macrognathus, 15, 41 (Text-fig. 9), 51
 chelicornis pubescens, 40, 41, 42, 51; Pl. II, fig. 2
 chelicornis rufescens, 40, 41, 51; Pl. II, fig. 3
 collinita, 14, 18, 33, 48
 coquinae, 35, 37, 50
 coquinae orangicus, 37
 coquinae typicus, 50
 crassimanus, 17
 cultrata, 38
 cuneicornis, 52
 darlingi, 31, 44, 47
 derbiana, 10, 11 (Text-fig. 1 b, B, C), 14, 16, 17, 18, 19, 33, 34, 35 (Text-fig. 7), 37, 42, 50; Pl. II, fig. 4
 erythronota, 17, 33, 34, 49
 erythronotoides, 17, 33 (Text-fig. 6), 49
 ferox, 13, 15, 18, 30, 31, 32 (Text-fig. 5), 47
 furcifera, 14, 18, 25, 45
 fusca, 12, 26, 44; Pl. VI, fig. 26
 glabrifrons, 17
 globicornis, 11 (Text-fig. 1 b, A), 13, 18, 27, 30, 46; Pl. V, fig. 21
 hamata, 14, 15, 39, 51
 hastata, 12, 17, 42, 52
 hostilis, 7, 8, 10, 13, 14, 15, 16, 17, 18, 33, 36, 37, 38, 39, 41, 42, 50; Pl. IV, figs. 16, 17; Pl. VI, fig. 29
 junodi, 14, 15, 39, 48, 50
 keyserlingi, 18
 lateralis, 17, 33, 34, 43, 49; Pl. V, fig. 34
 latimanus, 17
 lethalis, 12, 13, 14, 18, 24, 25 (Text-fig. 2 a), 26
 Solpuga lethalis rectus, 14, 18, 24, 25 (Text-fig. 2 b), 44; Pl. VII, fig. 37
 lethalis typicus, 14, 24, 44
 lineata, 12, 17, 19, 42, 43, 52; Pl. III, fig. 7; Pl. VI, fig. 33
 macer, 17
 maraisi, 17, 33, 49; Pl. V, fig. 23
 marshalli, 14, 15, 16, 17, 36, 38, 39, 50; Pl. VI, fig. 30
 methueni, 42, 52
 monteiroi, 16, 19, 26, 27, 28, 45; Pl. VII, fig. 38
 niassa, 18, 73
 niassa kafulica, 73 (Text-fig. 14)
 nigrescens, 43
 nigrobraccata, 43
 nitidiceps, 17
 ornithorhynchus, 42, 52; Pl. V, fig. 19
 picta, 12, 43
 pugalitor, 28
 rhodesiana, 73
 sagittaria, 18, 31, 47
 schlechteri, 18, 27, 45; Pl. IV, fig. 15
 schönlandi, 13, 16, 18, 29 (Text-fig. 4), 46, 73
 schultzei, 12, 43
 schweinfurthi, 18
 scopulata, 43
 sericea, 13, 16, 18, 31, 43, 44, 47; Pl. III, fig. 6
 serraticornis, 14, 18, 27, 46
 serraticornis umtalica, 28, 46
 spectralis, 17, 33, 49
 spiralicornis, 14, 18, 28, 29, 45, 46; Pl. V, fig. 18
 strepsiceros, 14, 18, 28, 29 (Text-fig. 3), 46; Pl. IV, fig. 13
 striata, 18, 43
 suffusca, 10, 32, 47; Pl. V, fig. 22
 tookei, 14, 35, 36 (Text-fig. 8), 50
 toppini, 26, 43, 44
 tubicen, 39, 50; Pl. VII, fig. 35
 venator, 8, 12, 13, 14, 16, 17, 18, 19, 22, 25, 26, 27, 30, 39, 45; Pl. I, fig. 1; Pl. IV, fig. 12
 venosa, 25, 44
 villosa, 16, 17, 39, 41, 42, 51
 vincta, 17, 33, 49
 zebrina, 18, 43
 SOLPUGIDAE, 67, 68
 SOLPUGINAE, 20, 21
 solus, Anchisaurus, 92
 Somera, 235
 poliostrota, 235
 spectralis, Solpuga, 17, 33, 49
 sphinx (cassinea), Brachionycha, 235
 spiralicornis, Solpuga, 14, 18, 28, 29, 45, 46; Pl. V, fig. 18
 spiritalis, Cerura, 170, 171, 171 ftn., 172, 173; Pl. I, fig. 10; Pl. III, figs. 7-9; Pl. V, figs. 1-3

- spurcata, *Antheua*, 176, 183, 222
 Zana, 235
 Stasimopus, 10, 12, 67
 Stauropus, 151, 152, 155, 184, 191, 194
 agramma, 191
 atribasalis, 191
 atrigitata, 186
 fagi, 194
 griseiviridis, 191
 interpellatrix, 185
 mediata, 184, 194, 195; Pl. V, fig. 4; Pl.
 VI, figs. 1-7
 octoginta, 191
 pergrisea, 191
 stemiptera, 191
 thalassina, 187
 steniptera, *Desmeocraera*, 185, 191; Pl.
 IV, figs. 12, 13
 Stauropus, 191
 Stenostaura, 151, 153, 155, 212, 215, 216
 impedita, 215; Pl. V, fig. 17; Pl. IX,
 figs. 1-4
 stictica, *Scrancia*, 210, 211; Pl. V, fig. 15;
 Pl. VIII, figs. 6-13
 stigmatica, *Phycitimorpha*, 208; Pl.
 VIII, figs. 1-5; Pl. XIV, fig. 8
 stormbergensis, *Plateosaurus*, 102, 116
 strepsiceros, *Solpuga*, 14, 18, 28, 29
 (Text-fig. 3), 46; Pl. IV, fig. 13
 striata, *Solpuga*, 18, 43
 strigosa, *Rethona*, 169
 STRIPHNOPTERYGIDAE, 152, 232,
 233
 subulata, *Daesia*, 53, 55
 suevicus, *Teratosaurus*, 118
 suffusca, *Solpuga*, 10, 32, 47; Pl. V, fig. 22
 swierstrae, *Cerura*, 170 ftn., 171, 173

Taeniopteryx, 151, 153, 158, 212
 cinerea, 212; Pl. VIII, figs. 14-19; Pl.
 XIV, fig. 9
 Tephrosia, 181
 macropoda, 181
 Teratosaurus, 118, 140
 suevicus, 118
teres, Tetragonites, 144; Pl. XXV, figs.
 1, 2
 testacea, *Pydna*, 228
 Tetragonites, 144
 epigonum, 144
 teres, 144; Pl. XXV, figs. 1, 2
 Timotheanum, 144
Thacona, 211
 thalassina, *Desmeocraera*, 184, 187; Pl.
 IV, fig. 9
 Stauropus, 187
 Thecodontosaurus, 91, 92, 117
 antiquus, 91, 92
 Browni, 117, 118, 138
 cylindrodon, 91
 minor, 92
 Thecodontosaurus skirtopodus, 92, 117,
 138
 Theropoda, 80, 97, 101, 103, 140
tigrinus, Pachydactylus capensis, 244;
 Pl. V
 Timotheanum, *Tetragonites*, 144
 tookei, *Solpuga*, 14, 35, 36 (Text-fig. 8),
 50
 toppini, *Solpuga*, 26, 43, 44
 Toreus, 18, 23, 63
 capensis, 63
 tosta, *Ramesa*, 222
 Trachycormocephalus, 253, 255
 transvaalensis, *Gryponyx*, 102, 140
 Trema, 202
 bracteolata, 202
 Trematoptychus, 245
 tricolor, *Antheua*, 175, 176, 177, 178, 179,
 180; Pl. I, fig. 17; Pl. III, figs. 10-15
 Blossia, 58, 60
 trigonopodus, *Ethmostigmus*, 248 (Figs.
 3, 4)
 Trimeria, 163, 170
 alnifolia, 163, 170
tripuncta, Desmeocraera, 184, 189; Pl.
 XIII, fig. 15
 trispinosa, *Lipophaga*, 65
 tropidogaster, *Zonurus*, 243
 tubicen, *Solpuga*, 39, 50; Pl. VII, fig. 35
 typicus, *Solpuga coquinae*, 59
 Solpuga lethalis, 14, 24, 44

 umtalica, *Solpuga serraticornis*, 28, 46
umzambiensis, Phylloceras, 142; Pl.
 XXIV, figs. 1-3
 uncifera, *Chadistra*, 201, 202
 unguicornis, *Blossia*, 19, 56, 60; Pl. VII,
 figs. 39, 40; Pl. VIII, figs. 44, 46
 uniformis, *Lophopteryx*, 166, 167; Pl. I,
 fig. 8; Pl. II, figs. 18-23
 Uroplectes, 27
 vittatus, 27

varia, *Antheua*, 179
varia, Desmeocraera, 185, 187; Pl. IV,
 fig. 7; Pl. XIII, figs. 11-13
 Velledae, *Phylloceras*, 143
 venator, *Solpuga*, 8, 12, 13, 14, 16, 17, 18,
 19, 22, 25, 26, 27, 30, 39, 45, 74; Pl.
 I, fig. 1; Pl. IV, fig. 12
 venosa, *Solpuga*, 25, 44
 vernalis, *Desmeocraera*, 184, 185, 186,
 187; Pl. IV, fig. 6
verulama, Osica, 180, 235
 villosa, *Rhus*, 180
 Solpuga, 16, 17, 39, 41, 42, 51
 vincta, *Solpuga*, 17, 33, 49
violacearia, Ichthyura, 162, 163; Pl.
 XIII, figs. 5, 6
 viridifolium, *Chrysophyllum*, 186
 vittata, *Rigema*, 197

- vittatus, *Uroplectes*, 27
vittifer, *Zonurus*, 242, 243
- warreni, *Zonurus*, 241
woerdeni, *Phalera*, 198
Rigema, 198
- Zana, 151, 157, 177, 196, 213, 221, 232, 235
anodonta, 221, 222; Pl. V, fig. 22
lignosa, 221
marpissa, 221, 222; Pl. V, fig. 21; Pl.
IX, figs. 24-29
spurcata, 176, 235
zebrina, *Solpuga*, 18, 43
Zeriassa, 12, 19, 21, 52, 53
- Zeriassa cuneicornis*, 52, 53
purcelli, 52, 53; Pl. VII, fig. 36
Zonurus, 239
barbertonensis, 240; Pl. III
breyeri, 239, 241; Pls. I, II
capensis, 242
cordylus, 242, 243
giganteus, 240, 242
jonesi, 243
robertsi, 241; Pl. IV
tropidogaster, 243
vittifer, 242, 243
warreni, 241
Zophodiopsis, 233
hyaenella, 233

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ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VII

PART I *containing*

A Short Survey of the Solifugae of South Africa.

By JOHN HEWITT. (With 8 plates and 14 text figures)

Addendum. (With 1 text figure)



Issued 31st October, 1919

PRINTED AT THE UNIVERSITY PRESS

CAMBRIDGE, ENGLAND

1919

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VOL. 7

PART I

A SHORT SURVEY OF THE SOLIFUGAE
OF SOUTH AFRICA

BY JOHN HEWITT

With 8 plates and 14 text figures

CONTENTS

	PAGE
Introduction	3
General Remarks on the external structure of SOLIFUGAE	4
External sexual differences	8
Notes on specific characters	12
Distribution of Species	16
Key to the Genera of S. African SOLIFUGAE	21
Genus Solpuga Licht.	24
Key to the S. African species of the Genus Solpuga	43
Genus Zeriassa Pocock	52
Key to the S. African species of Zeriassa	53
Genus Daesia Karsch	53
Key to the S. African species of Daesia	55
Genus Blossia Simon	56
Key to S. African species of Blossia	59

	PAGE
Genus Gluviopsis Kraepelin	61
Genus Hemiblossia Kraepelin	61
Key to Species of Hemiblossia	62
Genus Melanoblossia Purcell	62
Key to Species of Melanoblossia	62
Genus Toreus Purcell	63
Genus Ceroma K.	63
Key to Ceroma	64
Genus Lipophaga Purcell	65
Key to Lipophaga	65
Genus Hexisopus Karsch	66
Key to Hexisopus	69
Genus Chelypus Purcell	70
Key to Chelypus	72
Addendum Solpuga	73
Explanation of Plates	74
List of Recent Literature	75

A SHORT SURVEY OF THE SOLIFUGAE OF SOUTH AFRICA

INTRODUCTION.

THE study of the Solifugae has absorbed a certain amount of attention from Zoologists for many years. Morphologists regard them with interest because of the retention of primitive characters in their structure, as is conspicuously exhibited in the segmentation of the body: the systematist, on the other hand, is equally impressed by the remarkable diversity of forms found within the same genus, the variations of which seem to be promiscuous and largely discontinuous.

The Solifuge fauna of S. Africa is particularly rich: indeed, a fauna so abounding in genera and species as that found in the western and central portions of this subcontinent is not known from any other part of the world.

For our knowledge of the species we are indebted to various workers, but more particularly to Mr R. I. Pocock, Prof. K. Kraepelin and Dr W. F. Purcell. Mr Pocock's pioneer papers on the material in the British Museum of Natural History constitute the first important attempt to make known the great diversity that obtains within the limits of this order, and to classify the genera and species. His work considerably advanced the knowledge of this subject, but was somewhat marred by the very inferior illustrations that accompanied his accounts.

A few years later, Prof. Kraepelin's very useful monograph of the whole order was published in *Das Tierreich*. In this work all the known species were described, and the important characters as far as possible illustrated. Thus, it was, and still is, quite indispensable to students of this order, but is no longer sufficient as a guide to the species of the less familiar genera such as *Blossia*.

The best contributions to our knowledge of S. African Solifugae are those contained in Dr Purcell's several papers, based on the collections of the S. African Museum. These are sufficiently accurate and detailed to be accepted as a very reliable starting point in the study of our fauna.

Since the appearance of the above mentioned works, various new species have been described by the late Prof. Kraepelin and by the present writer. Kraepelin's papers are useful as presenting his final accounts of the fauna of South-West Africa and of the Kalahari.

During recent years a great deal of additional material has accumulated in the collections of the Museums of S. Africa, and although adequate material for even a moderately complete account of the variation exhibited within this order in S. Africa is still unavailable, yet I think a sufficient amount of new data has been obtained to justify the following revision of all the known species and varieties. The imperfections of our knowledge will be understood from the fact that very many species are only known from single specimens.

The present paper, based mainly on the collections of the Albany and

Transvaal Museums, is presented as a guide to the characters and gross distribution of the various genera and species now known to inhabit South Africa, the northern limits of which are the Zambesi and Cunene rivers on the east and west sides respectively: all the distribution data of earlier authors have been incorporated, but for detailed descriptions of the various species reference must be made to the original accounts.

SOME GENERAL REMARKS ON THE EXTERNAL STRUCTURE OF SOLIFUGAE.

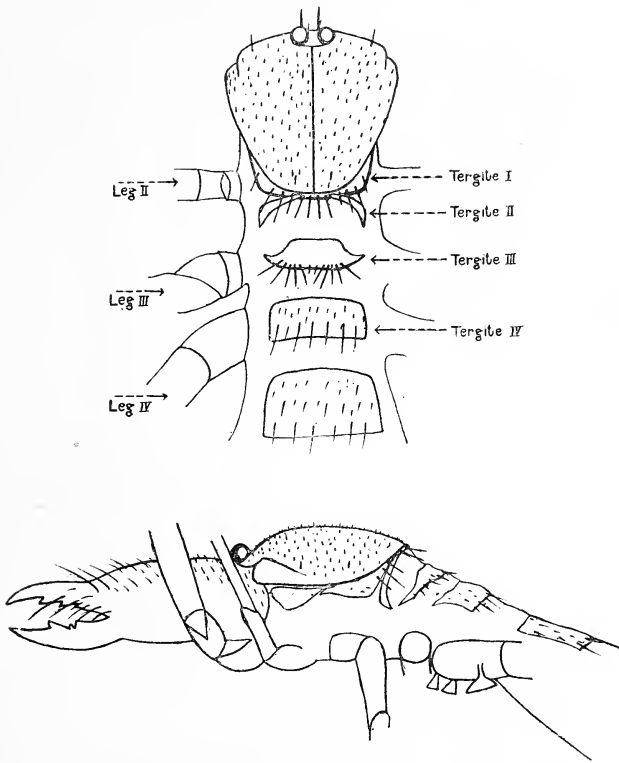
Some of the external characters presented by the Solifugae are very stable: the segmentation of the body and of its appendages (excluding the tarsi of the legs), and the position of the various apertures of the body, are thus not available for systematic purposes. The most important characters employed in the classification of the S. African forms are: The segmentation of the tarsi of the legs, the structure of the male flagellum, the nature of the dentition, and the modification of the hairs and bristles which clothe the various surfaces. Most workers have also attached considerable importance to the features of the very characteristic rostrum or camerostome¹ which has the mouth at its apex, but such variations as do occur in this structure amongst the various genera are not very striking, and seem to me of doubtful value in a natural classification.

The segmentation of the body is described in a general way in most text books of invertebrate zoology, and can be easily determined from fresh specimens or spirit-preserved material. Some confusion may arise in the case of *Hexisopus* and *Chelypus* where the tergites of the abdomen are not strongly chitinised, and thus are not easily distinguished. A source of difficulty may also be found in the segmentation of the thorax, the dorsal sclerites of which are much reduced in all Solifugae. In the accompanying figures, the relationship of these sclerites to the appendages has been indicated in accordance with the views expressed by Mr H. M. Bernard in his important treatise on the morphology of this order (27).

It should be mentioned, however, that the celebrated arachnologist W. Sorensen has recently presented a different interpretation of the sclerites behind the head-plate (28). He recognises only two thoracic tergites, viz. those labelled as third and fourth in this paper: according to him, those here labelled as first and second cannot be true tergites, because the elevator muscles of the appendages are not inserted thereon. Sorensen thus interprets the structure of a solifuge: head bearing four

¹ This has been homologised by Croneberg and by Gaskell (see *The Origin of Vertebrates*, pp. 222, 223) with the first antennae of Crustaceans: for another view see Bernard's monograph. The terms applied in this paper to the various appendages are those in current use amongst Arachnologists, and have no reference to their respective homologies with the appendages of other Arthropods. I may remark that the very characteristic chelicerae—sometimes unfortunately termed the mandibles—are apparently homologous with the second antennae of Crustaceans and with the antennae of insects, whilst the pedipalpi or palps are homologous with the mandibles of other Arthropods.

pairs of appendages, thorax with two tergites and two pairs of appendages, abdomen of 11 segments, the first of which is greatly reduced whilst the second or genital segment is largest. With regard to the thoracic tergites, I prefer Bernard's view seeing that the bristly armament of all four sclerites (the second excepted) in *Blossia* has much in common but differs from that of the head-plate: in short, they seem to be homologous structures. The two separated portions of the second tergite are certainly devoid of spines or bristles in *Blossia*, but a few setae occur near the anterior edge in *Hemiblossia*. It may be added



Text fig. 1. Dorsal and lateral views of the cephalothoracic region of a female *Blossia* sp.

that the third tergite, though not divided, has its spines in two separated groups.

For an ingenious hypothetical explanation of the composition of the head-plate, the reader is also referred to Mr Bernard's paper. Here, I only mention this structure in order to direct attention to variations therein. Amongst the various S. African genera there are considerable differences in the shape of the head-plate, the proportions of which moreover may differ greatly in the two sexes of the same species, the female being more robust than the male. In most genera, the lateral portion,

extending ventralwards on each side, is not very extensive, but in Chelypus and Hexisopus the lateral extensions are quite strongly developed, and the head-region is thus particularly robust. Normally, the lower portion of this lateral extension is separated from the upper only by a deep broad groove, but in Blossia the compound nature of the structure is indicated by a well-marked suture line, running immediately ventral to the somewhat ill-defined groove and separating off the lowest portion of the lateral extension as a distinct sclerite: the suture line is faintly indicated also in other genera. This sclerite may possibly be an isolated anterior portion of the first tergite, but in Blossia is not completely fused with the forward continuation of what appears to be the first thoracic tergite. It may also be noticed that whereas in most Solifugae the anterior lateral lobe of the head-plate, which is said to bear rudimentary eyes¹, is only partially separated from the main plate, a more complete separation occurs in Chelypus, where a fairly distinct suture line extends backwards to the posterior margin of the plate.

The segmentation of the legs, excluding the tarsi, is fundamentally similar throughout the order. Dr Purcell in describing Hexisopus (9) laid some stress on the supposed fact that this genus has a reduced number of trochanter segments, thus differing from all other known genera. The same view seems to have been held previously by Mr Simon, for, in his account of *Hexisopus fodiens*, the trochanter segments are given as two, and the tarsal segments also as two. In *Das Tierreich*, Purcell's views on the homology of these leg segments are mentioned, but Kraepelin adopts what is undoubtedly a more correct interpretation, without however presenting any reasons for his homologies. In most Solpugids, the distal trochanter segment of legs II-IV is very characteristic, having a dorsal infolding of chitin marked externally by a definite line extending over the length of the segment. In Hexisopus, this line is scarcely noticeable, and as the third trochanter of leg IV is greatly elongated, like a femur, whilst the true femur is abbreviated, a confusion of homology is not surprising. The third trochanter of leg IV in Chelypus, however, shews the dorsal line very distinctly and there can be no doubt of the identity of the segment. The homologies of the leg segments can also be traced quite independently from the character of the articulations, certain of which are quite distinctive. In a Solpuga, there are specialised areas of thickened chitin arranged in pairs at particular joints, where the movements of the segments concerned are restricted to one plane, viz. between the patella and tibia of the palp, between the femur and patella, and between the patella and tibia of all the legs. In the second or third leg of Chelypus these can be seen without difficulty, and, relying on this character alone, the third leg of Chelypus is found to have three fairly large trochanter segments but only one tarsal segment.

In the terminology of the segments of the legs, I prefer to follow

¹ W. Sorensen was unable to find the rudimentary eyes, nor could the present writer. In the recent edition of the *Encyclopaedia Britannica*, E. R. Lankester speaks of "a pair of median eyes and obsolete lateral eyes on each side."

Pocock's scheme¹, as given in the Arachnida volume of the *Fauna of British India*, rather than that adopted by Kraepelin or the slightly different one of Sorensen: it may be noted, however, that Pocock's account is not free from error, for he represents legs II-IV as having each the same number of trochanter segments. The segments of the palp are: coxa, trochanter, femur, patella, tibia, and tarsus, which latter is usually fixed immovably to the tibia, is without claws, and is composed of one segment, excluding the rudimentary segment or segments found in the terminal sucker, which according to Sorensen is morphologically equivalent to the claw-bearing plantula of a walking leg. The segments of the legs are similar, but between the coxa and the femur there are several trochanter segments, viz. two in legs I and II, and three in legs III and IV: a special term is given to the distal trochanter segment in each case, viz. the trochantin, although it is represented both by Kraepelin and Sorensen as "the basal joint of the femur," and thus equivalent to the single segment called trochanter in the palp. The middle trochanter segment of legs III and IV is termed the trochantella. This and the proximal segment to which the term trochanter now becomes restricted are, according to Sorensen, parts of the coxa—a conclusion which seems to me very reasonable from consideration of such a case as the fourth leg of *Chelypus*. The joints between trochantella and trochantin, and between trochantin and femur, permit of a good deal of twisting of the leg, but, as previously mentioned, the next two joints only permit of movements in one plane. The tarsi of the legs present a character which varies considerably throughout the order, although within the limits of the same genus the tarsal characters are generally very constant in specimens of all ages. The segmentation of the tarsi is utilised as a very convenient generic character, the range of which is sufficiently indicated in my key to the genera.

In various genera, the tarsus of the fourth leg is more numerous segmented than the tarsi of preceding legs, and as this multi-segmented condition is presumably secondary, the occurrence of minor segmented aberrations from the normal may perhaps be expected. I believe that such aberrations will prove to be not very uncommon. One such has even been made the type of a distinct genus (*Broomiella* Pock.), for this seems to be founded on an abnormal specimen of *Daesia schreineri*, having a two-jointed fourth tarsus instead of the usual four-jointed tarsus. I have also seen a male of *Solpuga hostilis* from Doornkop, in

¹ Nevertheless, within the comparatively narrow limits of the Arachnida, the homologies of the individual segments of the legs amongst the various orders are by no means certain: whilst a uniform nomenclature for the Arthropoda as a whole seems quite impracticable on the basis of homology. Many morphologists believe that a though the palp in many orders is 6-jointed, yet the segmentation is not strictly homologous throughout: as Pocock on the other hand has represented it. This view is set forth in Simon's important work *Histoire naturelle des Araignées*. Thus, a patella of the type found in spiders is held to be wanting in the Solifugae, and it must be admitted that the nature of the articulations is quite different in these two orders: the segment termed patella in this paper is represented to be equivalent to the combined patella and tibia of spiders, and the segment here called tibia as homologous with the metatarsus of spiders.

which the third leg on the right side has a seven-jointed tarsus, like the fourth leg, whilst that on the left side is four-jointed as usual: the right third leg is apparently not abnormal in any other way, the basal portions being like those of a normal third leg.

The spinulation of the legs is also a very constant character within the same genus. Spines are most strongly developed in the genus *Solpuga*, where legs III and IV are spined as follows: *Fourth leg*, patella with a pair inferiorly near the apex, tibia with five (sometimes six or four) on the anterior surface, and three (but varying from two to five) on the posterior surface, tarsus with ten pairs inferiorly (or 11-10): *Third leg*, patella with two at the apex superiorly and three on the inferior surface, including a pair at the apex, tibia with five superiorly and three pairs inferiorly (occasionally 4·3 or 4·4), tarsus with seven pairs inferiorly. The first leg is completely devoid of spines, and the second leg is spined more or less like the third but the tibia may have 3·2 or 2·1 spines ventrally and the tarsus four spines or none externally above. These are all strong spines: in addition, there may be shorter and weaker ones on the second and third tarsi inferiorly.

In all other genera the number of spines on the tarsi are fewer: in *Daesia*, the tarsus of leg IV has three pairs of spines infero-laterally.

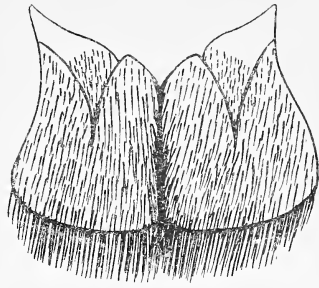
EXTERNAL SEXUAL DIFFERENCES.

Externally, the sexes are distinguished primarily on the characters of the first abdominal sternite (it is actually the second sternite according to Sorensen). This genital sternite is seen in its simplest form in the adult female of the genus *Lipophaga*, where the two flaps, representing a pair of appendages, remain quite distinct from each other and either one can be raised independently: the posterior mesial angle of each flap is acute. In other genera, these flaps are firmly united along the midline by membrane: sometimes, as in *Solpuga venator*, union takes place along the whole length of the flaps, and their hind borders are broadly rounded on each side: occasionally, as in *Solpuga chelicornis* and *hostilis*, an acute posterior lobe at the apex of each flap remains free, a condition which presumably is more primitive than that of *venator*. The female genital aperture lies in the soft skin posterior to and protected by the sternite, and is quite large in adults. In adult females of *Solpuga* there is often a small brown scar or several scars on the anterior portion of the genital sternite mesially: this is presumably a mark made by the male during the mating process and is thus indicative of sexual maturity¹.

On the other hand, the genital aperture of the adult male opens on the surface of the same sternite. The two halves are united together, but in the middle they enclose a pair of long convexly raised sclerites between which mesially is the elongated slit-like genital aperture. These sclerites occur in young males as well as in adults but are much larger in the adults relatively as well as absolutely.

¹ An account of the mating habits of *Galeodes* is given by R. Heymons in a paper entitled "Biologische Beobachtungen an asiatischen Solifugen" in *Abh. Preuss. Akad. Wiss. Berlin*, 1901.

Each half of the genital sternite is actually a compound structure in both sexes: the parts of which it is composed are entirely fused together posteriorly, but anteriorly the suture lines can be easily recognised. The half sternite is therefore interpreted by Bernard as derived from two segments of an appendage incompletely separated by interarticular membrane, and I may remark that the so-called segmental and interarticular regions are somewhat different in their coverings of hair: in the example figured (*Daesia lineata*) the triangular interarticular portion is clothed only with comparatively short fine hairs whilst the rest of the sternite bears also a great number of much longer and stiffer setae which are cleft or even trifurcated at the tips.



Text fig. 1 a. Genital sternite in the adult female of *Daesia lineata*: flattened out. That of the male is similar, but has also a pair of elongated sclerites mesially.

In most species, the adult male is characterised by the possession of the flagellum on each chelicera. This organ is derived from a socketed bristle, and thus the rotatable flagellum of a *Blossia* presumably represents a more primitive condition than that of *Solpuga* which is fixed. Dr Purcell has described an enlarged feather bristle in the genus *Melanoblossia* as a flagellum, and in other genera could find no flagellum whatever in what appeared to be the adult male. It now appears that more or less enlarged feather bristles may co-exist with a true flagellum in the genus *Blossia*: this occurs in the species *B. falcicornis* and *B. filicornis*, where some of the more distal feathered bristles of the series on the mesial surface of the chelicera are considerably longer and stronger than those proximally situated. Moreover, the position of the point of attachment of the flagellum relative to the series of feather bristles is very variable: sometimes in the genus *Blossia* it is at the distal end of the line of feather bristles, but in *Blossia falcifera* it lies between the distal enlarged bristles and the dental series, whilst in the genus *Daesia* the base of the flagellum is far removed from the line of feather bristles. However, Sorensen, after examining in some detail the structure and homology of the flagella of several genera, concludes that morphologically the flagellum is the superior bristle or the two superior bristles of the series.

I am satisfied that Sorensen's conclusion is quite correct. Not only is the original relation to the line of feather bristles retained in the genus *Blossia*, but here too the flagellum is primitive in form, being a greatly inflated bristle cut open along its length. The genus *Solpuga*, which is far more specialised, affords confirmatory evidence, although the flagellum of adults has little resemblance to a bristle. The mesial surface of the upper jaw of a very young *Solpuga* presents two long oblique series of bristles, that adjacent to the cutting edge including about 23 bristles, all feathered with the exception of the distal one which is fairly long but simple: the other series, parallel thereto, consists entirely of simple

bristles, the basal ones stout and strong and the distal ones much more slender. In older specimens, the feather bristles are more numerous and may occupy several rows. On examining a subadult male of *S. derbiana*, as yet without a flagellum proper, I find near the distal end of the feathered series several simple bristles of which one is markedly stouter than the rest and strongly curved like the feather bristles. This enlarged bristle, which seems to correspond with the single one at the distal end of the feathered series of juvenile specimens, is presumably destined to become the flagellum at the last moult.

In such genera as *Blossia* and *Hemiblossia* the feather bristles of the adult, in both sexes, occupy only a single series of about 14-17: they are all feathered, the distal ones often larger than, but not so strongly feathered as, the basal bristles. *Daesia* has more numerous bristles arranged in a double row in the adult, all being feathered.

The primitive flagellum of the *Daesiinae* is simply a membrane with more or less infolded edges which basally unite to form a cup: the rotatable flagellum of *Hexisopus* and of *Ceroma* is probably to be derived therefrom by more extensive fusion throughout its length, whereby the free membrane becomes converted into a flattened tubular shaft: the fixed flagellum of *Solpuga* has a swollen basal enlargement which probably corresponds to the cup-like base found in *Blossia*, and the more or less elongated shaft is usually if not always perforated by a fine canal along its length. The flagellum of *Solpuga* is far more variable in form than the primitive flagella of the *Daesiinae* and *Hexisopodinae*: in the least modified species such as *suffusca*, it lies on the flat or convex upper surface of the chelicera, but in various specialised forms of the *hostilis* group the basal portions of the flagellum become sunk into a distinct depression of the inner and upper surfaces of the jaw.

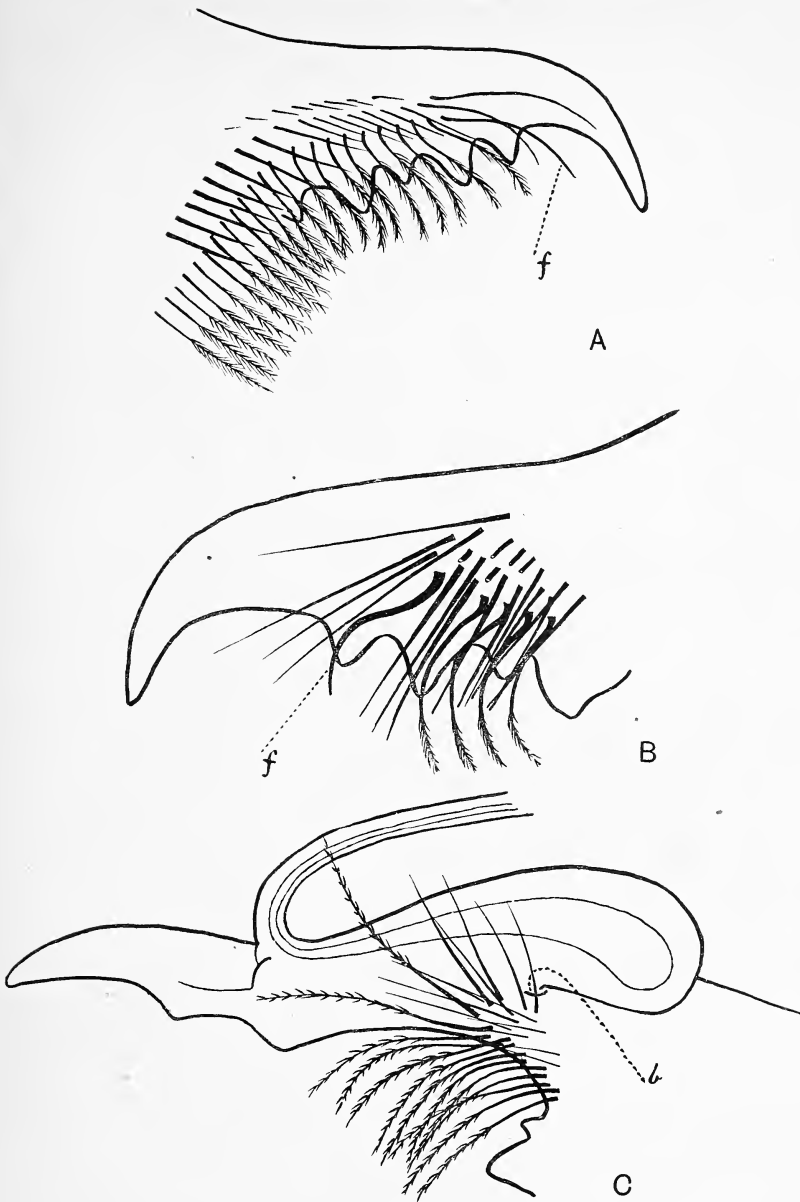
In the *Daesiinae* the adult males are often provided with curiously modified bristles on the second abdominal sternite: these are absent in females or if present are not so highly developed as in males.

When bristles and spines occur over the surfaces of the appendages and body they are more strongly developed in males than in females, except on the mesial surfaces of the jaws.

Other secondary sexual characters are presented by the dentition, which is often greatly modified in the adult male but primitive in the female: the malleoli of males are much larger than those of the females: lastly, males are more slender than females, having longer limbs and smaller bodies but the disparity in size is not great.

The adult male of *Solpuga* has an organ on the palp, viz. the Scopula, which is quite absent in females. It is composed of numerous, closely packed, short, feathered hairs, which are presumably sensory in function. It is interesting to notice that a similar organ occurs on the tarsi of the legs in the adult male of *Stasimopus* (trap-door spider), but not in the female. I have elsewhere¹ presented reasons for regarding the Scopula of *Stasimopus* as an organ of smell. There is an important difference,

¹ "Note on the occurrence of a pedal nose in the male of a trap-door spider (*Stasimopus*)" in *South African Journal of Science*, March, 1917.



Text fig. 1 b.

- A. Mesial surface of upper jaw of young *Solpuga* from Pretoria (? *globoicornis*), having only 3 malleoli: shewing parallel rows of feather bristles and of simple bristles.
- B. Distal portion of upper jaw of subadult male of *Solpuga derbiana* (basal portions only of some of the simple bristles are indicated).
- C. Distal portion of upper jaw of adult male of *Solpuga derbiana*.

[f = flagellar bristle. b = point of origin of flagellum.]

however, in the hairs of the two Scopulae: those of *Stasimopus* are simple, but truncated or more or less trumpet-shaped at the tips where the protoplasmic core comes into close contact with the exterior: those of *Solpuga* are well feathered, and the tips finely pointed. If the receptive portion of an olfactory organ must necessarily permit of direct contact between living protoplasm and odoriferous particles, it does not seem probable that the scopula of *Solpuga* can subserve an olfactory function. Perhaps the truncated bristles such as occur commonly on the palps almost throughout the Solifugae will prove to be olfactory. Although I have not specially searched for sensory organs I may add that organs, apparently of sensory function, have been found by H. J. Hansen¹ and by H. M. Bernard and were identified as Lyriform organs. In the Solifugae they are almost confined to the chelicerae. In addition, there are what seem to be sensory organs near to the cutting edges of the jaws: over the surface of the fang and on the outer side of the jaw near to the row of teeth the thick chitin is pierced by numerous very long canals, each opening by a small pore on the surface. Similar organs occur in great numbers on the legs of various spiders, along with the several more complicated structures to which the term "lyriform" was originally applied.

NOTES ON SPECIFIC CHARACTERS.

The characters employed in the discrimination of species are primarily those peculiar to the adult male. Although various authors have also attempted to distinguish species on female characters, and have drawn up keys to the species of *Solpuga* based mainly on such characters as are afforded by measurements and colour, yet with the larger amount of material now available it seems to me quite impossible in many cases to distinguish between the females of closely allied species. They are often much more generalised than the males. This is markedly the case in respect to the dentition, which is highly variable amongst the males of different species and genera, but is essentially identical throughout the females of many species of *Solpuga* and even of widely different genera such as *Zeriassa*, *Blossia* and *Daesia*. This type of dentition, found both in males and females of *Solpuga venator* or of *S. lethalis*, is without doubt primitive.

On the dental characters, the females of the genus *Solpuga* can be divided into several groups, the largest including all those species exhibiting the primitive type of dentition; one small aberrant group includes *S. lineata* and allies, which have a much modified dentition in the upper jaw of both sexes, and might with some propriety be assigned the rank of a distinct genus: the two species *picta* and *schultzei*, only known from female specimens, constitute a third group; another little group is that of *S. hastata* and allies, and lastly the species *S. fusca* differs from all others in the genus in the character of two or three intermediate teeth, instead of one only, in the lower jaw. On the other characters found in females, it is possible to divide the genus a little

¹ "Organs and characters in different Orders of Arachnids." *Ent. Med. u. a. Ent. For. Fr. Meinert*, 1893, p. 178, Kjobenhavn.

further. These characters are: the colouration, which does not vary much within a species, being similar in the two sexes, and fairly constant throughout large groups of species: the shape of the hind borders of the genital sternite, whether broadly rounded on each side or produced into a pair of mesial lobes, the former condition being correlated on the whole with plain colouration, and the latter condition with strongly contrasting colours such as occur in the *hostilis* group: also, but of somewhat less value is the degree of hairiness of the hind legs, long silky hairs being most strikingly developed in *S. sericea*, whilst such hairs are absent in *venator* and allies but more or less strongly developed in the species of the *hostilis* group: finally, the proportions in length of the segments of the palps, and legs, compared together and with the breadth of the head-plate, and the degree of development of cylinder bristles on the lower surfaces of the palp are characters which may serve to distinguish the females of certain species from each other. But, having thus relegated a specimen to its natural group, it is usually impossible to proceed further. Dr Purcell has commented on the difficulty of distinguishing between the adult females of *S. venator* and *S. lethalis*, and I may add that the three species *ferox*, *schönlandi* and *globicornis*, though very markedly distinct in the male sex, are practically identical in females. In this paper I have therefore largely ignored the females when distinguishing between species, and those species which have been founded only on female specimens by previous authors are now placed aside as *incertae sedis*: most of them can never be identified, except through the locality data.

The systematics of the genus *Solpuga* is largely a study of variation in the male flagellum. This organ presents quite a bewildering series of forms throughout the genus, but usually shews a high degree of constancy in the same species. Many of its forms shew no obvious relationship to each other: indeed, to a large extent the variation appears to be quite erratic and discontinuous. Species which in structure are practically identical as females, and which are no doubt closely related, may nevertheless have profoundly different flagella, as is the case in *ferox*, *schönlandi* and *globicornis*, the flagella of which so far as is known are not connected together, even indirectly through other species. It is obvious therefore that as a guide to genetic affinity the characters of this organ may be of very subordinate value. Discontinuous variation is noticeable in every section of the genus, but is accompanied by considerable variation of a continuous type. Dr Purcell has remarked on the variation in length exhibited by the flagellum of *S. venator* in specimens from various localities (9). In this case, a fairly wide range is observed, and it might be possible to distinguish several races or local forms on differences in the length of the shaft, the northern varieties having a longer flagellum than southern forms. In such a continuous series, the elimination of the intermediate forms would result in the formation of quite distinct groups. However, I do not know of any pair of species which differ from each other only in the length of the flagellum, and as a matter of fact, the observed variation in length of the flagellum in most species is limited to a comparatively narrow range. Nevertheless, in some sections of the

genus, the characters which distinguish the several forms commonly termed species are not of an essentially discontinuous type. There is a small group of species, characterised by the more or less strongly twisted shaft of the flagellum, and the presence of serrated edges along some portion of this shaft. These species (*spiralicornis*, *serraticornis* and *strepsiceros*) seem to represent separate links in a chain of continuously varying forms: a complete series of intermediate forms is not yet known, but sufficient variation has been noted in a small series of *spiralicornis*, and in several specimens of *serraticornis*, to indicate that the specific distinctions, though greater in magnitude, are essentially of the same kind as those which are now included within the limits of the same species, and which are clearly of the continuous type. I suspect it will eventually be found that the species *cervina*, *collinita* and *alcicornis* are also forms of one continuous series: and apparently another such series is that of *lethalis typicus*, *lethalis rectus* and *furcifera*.

Amongst the nocturnal species, which constitute the most primitive group of the genus, it sometimes happens that the only noticeable differences between species are those of the flagellum. This is the case with *S. lethalis* and *S. venator*, for the minor difference of dentition which is also said to distinguish them is not constant, and moreover is commonly found within the limits of a single species.

In these nocturnal species, the dentition of the male greatly resembles that of the female, and several other characters of the chelicerae, viz. the strong development of stridulatory ridges, and the abundance of well-feathered bristles in both upper and lower jaws are common to both sexes.

More usually, profound differences of dentition, or of spinulation, accompany the variations of the flagellum. Sometimes indeed, the characters of the flagellum may remain very constant throughout a group of forms which differ amongst themselves in the dental characters. This is the case, at least so far as the shaft of the flagellum is concerned, throughout the species *hostilis*, *derbiana*, and *tookei*, the most characteristic feature of the shaft being its sharp blade-like termination: this same blade with modifications also occurs in *hamata* and *bechuanica*: it seems to be quite constant in *hostilis*, but is variable in *derbiana*, and therefore cannot be regarded as an absolute unit character in a strict sense.

The variations of dentition in the *hostilis* group of species are indeed very numerous. The dentition is comparatively constant within the limits of any one form, and such forms as *hostilis* may have a fairly wide geographical range: but, we are still uncertain whether the various types are fundamentally distinct, or are units of one or several continuous series. The occurrence of a dentition so aberrant as that of *junodi* in the midst of an area occupied by allies (*hostilis*, *marshalli*) which share the most characteristic feature of quite a different dental type, is suggestive of mutational variation. On the other hand, the additional material received during recent years has to some extent served to bridge the wide gaps which formerly seemed to separate types so distinct as *chelicornis*, *hostilis* and *junodi*. The typical form of *chelicornis*, found in the karroid portions of the Cape, is represented at Kakamas by a dis-

tinct variety, *macrognathus*, with elongated jaws, which, in the dentition, is not very different from *hamata* found in the Waterberg district; and again, either of the two latter forms can by slight modification be changed into *bechuanica*, as found at Serowe in the Bechuanaland protectorate; this by reduction of the two anterior teeth leads on to *hostilis* of the Transvaal and *marshalli* of Mashonaland, or by enlargement of the same teeth to *junodi* of the Zoutpansberg and Waterberg districts. The known facts seem to be easily interpreted as the results of continuous variation, but it is proper to add that a complete series of intermediates is unknown, and that, from the nature of the case, all possible variants of the dentition could be arranged within an apparently continuous series arbitrarily chosen.

Other characters of systematic value, found amongst males, are the spines or bristles on the upper and outer surfaces of the chelicerae, and the tooth or keel which is often present on the dorsal edge of the mesial surface of the upper fang. These characters in particular species are often highly developed, and present the appearance of hypertrophied structures. The dorsal tooth of the fang of *ferox*, for example, is very markedly stronger than that of any other species.

This hypertrophied appearance, which is also exhibited by the characters of the flagellum (cp. that of the *cervina* group) and of the dentition (cp. *marshalli*) in various species, seems to suggest that variation, either continuous or discontinuous, has proceeded uncontrolled beyond the limits actually required by the creature for the maintenance of its race. That is to say, it seems improbable that natural selection can have been the sole guiding factor in directing the course of variation. Unfortunately, this view cannot be checked by an adequate body of facts based on acquaintance with the mode of life of the various species. The function of the flagellum itself is unknown: it is not a weapon of offence or defence, and according to Heymons' account of the breeding habits in *Galeodes*, is not employed during the mating process. Nevertheless, Sorensen believes that the flagellum is eminently adapted to the function of handling spermatophores and states emphatically: "Le flagellum est l'organe copulateur des Solifuges." At present, this is unsupported by observations on the living animal, and to me the hypothesis seems improbable in view of the extraordinary diversity in form presented by the shaft and the complete absence of the flagellum in some genera¹.

¹ See also R. I. Pocock in *A Monograph of the Terrestrial Carboniferous Arachnida of Great Britain*, 1911, p. 2: "An important factor in the evolution of terrestrial Arachnida has been, in my opinion, a change from the method of pairing, as practised by Scorpions, to new and special methods, resulting in the modification of a part of one of the prothoracic limbs into an intromittent organ, often of great complexity. This may be seen in the Araneae, where the palps are modified, in the Solifugae, where the mandibles are modified, in some of the Acari, and lastly in the Ricinulei, where the legs of the third pair are modified. Even the Opiliones possess very special secondary reproductive organs."

In the Cambridge edition of the *Encyclopaedia Britannica* the account of Arachnida by E. Ray Lankester includes the following: "? intromittent organ of male (solifuge) lodged on the dorsal side of the first pair of prosomatic appendages."

In the *hostilis* group of species, which are all diurnal in habit, it is noteworthy that the stridulatory ridges on the chelicerae are usually reduced or even quite absent in the males, but are well developed in the females. Whilst losing the power to stridulate,—for which, perhaps, they are compensated by increased speed,—the males at the same time add to their ornamental characters: the colours become more vivid, and the fringes of long hair on the legs more strongly developed, the adult male of such species as *chelicornis* and *villosa* being quite strikingly handsome. But often, as in *derbiana*, females are more brilliantly coloured than males. Stridulation is only audible to man in the case of the largest nocturnal species, and perhaps does not operate apart from mastication amongst most solifuges. The nocturnal species shew no sexual differences in colour ornamentation, nor in hair development on the legs. It is in fact the general rule in this genus, that all the species exhibiting specialisations of structure or of colour, in one sex or in both, are diurnal in habit: the nocturnal species are all primitive in structure and plain-coloured.

DISTRIBUTION OF SPECIES.

Owing to insufficiency of material, the distribution of the species cannot be profitably discussed except in the case of the genus *Solpuga*. The nocturnal species of *Solpuga* often have a very wide range of distribution. The common species (*S. venator*) of the Karroo and Eastern Province of the Cape extends far into South-West Africa, and another large nocturnal species (*S. monteiroi*) in the northern parts of S. Africa seems to extend its range right across the continent from Delagoa to Walfish Bay. The common species of Johannesburg (*S. schönlandi*) occurs also at Kimberley, and in the Eastern Province of the Cape.

The diurnal species on the other hand have usually a very limited distribution. Two diurnal species are only known from the Cape Peninsula. No one species is known to range from the Transvaal to the Cape, and the species found near Pretoria and Johannesburg (*S. hostilis*) does not extend so far as Kimberley or Bloemfontein. In *Das Tierreich*, Kraepelin records *S. marshalli* from Mashonaland and from Durban, but this is no doubt incorrect. A partial exception to the general rule is found in species which occupy a large area of more or less uniform conditions. The handsomely coloured *S. chelicornis* thus ranges from Namaqualand to the karroid regions of Eastern Cape Province, though it seems more than likely that this species is not uniform throughout, but composed of a number of structurally distinct forms. *Solpuga hostilis*, again, enjoys a fairly wide distribution over portions of the high and middle veld of the Transvaal and of adjoining parts in Natal. A still more extensive range has been indicated for *S. sericea* Poc., the type of which came from Mashonaland, and which has since been recorded from the Zoutpansberg district by Dr Purcell, and from several localities north of the Zambesi by Mr Hirst: but this case is not so anomalous inasmuch as the species, though diurnal in habit, nevertheless belongs to the large primitive group which includes all the nocturnal species.

When the species have been arranged into so many natural groups,

according to their structure, it is of interest to see how those groups are distributed in nature. It is important however to guarantee the accuracy of the scheme as an index to genetic affinity, and for this reason the data presented by the more specialised class of diurnal species can be more safely used than that of the primitive nocturnal species.

A large natural group of nine species, including *hostilis*, *marshalli* and *derbiana*, ranges over Southern Rhodesia, Transvaal, Bechuanaland Protectorate, Free State, Natal and Eastern Cape Colony: it does not occur in Western Cape Colony, the western limit, at present known, being at Somerset East. A small group somewhat related to this, but distinctly separated therefrom in structure, includes only the Capetown species *S. vincta*, the Little Namaqualand species *S. spectralis*, and another western form *S. maraisi* found at Worcester and Stellenbosch. Another small group, also related to the two just mentioned, includes *erythronota* of unknown locality, *erythronotoides* from Victoria West, and *lateralis* from the districts of Uitenhage, Port Elizabeth, and Bathurst. A fourth group of diurnal species, ranking as a well-marked section, includes the two species *chelicornis* and *villosa*, which range throughout the karroid regions of the Cape into Little Namaqualand.

In addition, there are two other groups of diurnal species, neither of which is directly related to those already mentioned. One of them includes *hastata* and two other species which are all from Great Namaqualand, and no member of the group is known to occur elsewhere. Lastly, the very distinct section comprised by *lineata* and its ally *brevipalpis*, occurs widely distributed in the western and central districts of the Cape, excluding the Cape Peninsula: eastwards, its limit appears to be Alice-dale. All these diurnal groups seem to be peculiarly S. African, having, so far as we know, no representatives north of the Zambesi.

It will be seen therefore that the subcontinent is thus divided up into so many distinct regions, each of which is the home of one particular natural group and that for the most part these regions do not overlap. An exception to this generalisation is presented in the case of the *lineata* group, which occupies almost the same region as *chelicornis*. The rule, however, only applies to groups which are sufficiently closely related: *lineata* is so remote in structure from *chelicornis* as almost to warrant generic separation therefrom.

It is interesting to notice that these geographical regions coincide—but not rigidly so—with the regions occupied by the natural groups of other animals, belonging even to different phyla of the animal kingdom. The eastern area, occupied by *hostilis* and its immediate allies, is the same as that occupied by the *glabrifrons-latimanus* group of the scorpion genus *Opisthophthalmus*: the nearest allies of this group are: *austerus*, a Karroo species which agrees fairly with *S. chelicornis* and *villosa* in its range: *macer*, a western species which occurs near Capetown extending northwards as far as Worcester and Ceres, and eastwards for some distance along the Cape Coast: *crassimanus* which occurs in Little Namaqualand and Carnarvon, and *nitidiceps* its close ally which occurs in the Albany, Uitenhage, Somerset East and Cradock districts. The almost universal change of fauna experienced in passing through the Cape

Province from east to west is exhibited in more simple fashion by the water frogs: the species found at Grahamstown is *Rana angolensis*, the same as occurs throughout the Transvaal, Natal, and Rhodesia: quite a different species occurs at Capetown, viz. *Rana fuscipectus*, which is characteristic of the western half of Cape Province.

Again, just as each group of species has its own particular area of distribution, so also each individual species seems to have a special part of each large area for its sole occupation. So far as is known, two diurnal species of *Solpuga* never occur together, except in the case of species which are very distantly related. This fact may perhaps be held to witness against the mutation hypothesis of species formation so far as this group is concerned.

Amongst the numerous more primitive species of *Solpuga*, only a few natural groups can be recognised with certainty. The northern section of black-striped forms includes *sericea* of Mashonaland, Zoutpansberg district, and N. Rhodesia, *celeripes* of Salisbury, *striata* of Damaraland and *zebrina* of the Taru desert in British E. Africa. The well-marked section comprising *cervina*, *collinita*, and *alcicornis*, belongs to the western half of the subcontinent, being known from Clanwilliam, Namaqualand, Willowmore, Keetmanshoop and Kuruman. An equally distinct group is that of *strepsiceros*, *spiralicornis*, and *serraticornis* which occurs in S. Rhodesia, Zoutpansberg and Barberton districts; but, a near relative of *serraticornis* is the species *S. schlechteri*, found in Bushmanland and Great Namaqualand: other species apparently referable to this section range far into tropical Africa, one of them *keyserlingi* (perhaps a synonym of *schweinfurthi*) being known to me from N. Nigeria. The group including *schönlandi*, *ferox*, *globicornis*, and *sagittaria*, which is doubtfully natural, seems to range almost over the same area as that occupied by the *hostilis-derbiana* group but it has relationships with central African species, for *S. niassa* seems to be an ally of *schönlandi*. The species *venator*, *lethalis*, *lethalis rectus*, and *furcifera*, are undoubtedly closely related and belong essentially to the western portion of the subcontinent, *venator* extending into the karroid region of the Cape. The precise relationships of the other species, and the inter-relationships of the above groups, are too uncertain to justify any general conclusions therefrom.

The main facts concerning the distribution of the more familiar genera are given by Kraepelin in *Das Tierreich*. Since the publication of that work, the following new genera have been described from S. Africa by Dr Purcell: *Melanoblossia*, *Lipophaga*, *Toreus*, and *Chelypus*. So far as we know, they are all restricted to Southern Africa, as also is the genus *Hexisopus*: further, all five genera belong essentially to the western region, which includes also the Karroo and Kalahari. At present, not a single species of any of these genera is known to occur in Natal, Transvaal, Free State, or in east Cape Colony

Hemisobolus has been recorded by Pocock from Guatemala, but otherwise is only known from S. Africa: this distribution points to great antiquity for the genus, and is in accordance with its primitive nature.

Of the other genera found in S. Africa, the most widely distributed seems to be *Gluviopsis*, which occurs as far north as Algiers, and extends into Asia Minor, Arabia, Socotra and Western India. *Daesia* also occurs throughout Africa (excluding West Africa, from the Congo basin northwards through the coastal countries as far as Morocco, which regions are all very poor in Solifugae) and extends into Palestine and Arabia.

Solpuga ranges throughout Africa, and *Blossia* seems to have the same range: *Zeriassa* is only known from the tropical parts of South Africa, and from East Africa as far north as Somaliland. *Ceroma* extends from the western region of S. Africa, northwards into East Africa.

Only one genus, *Solpuga*, is known to me from Natal: however Kraepelin has recorded a *Blossia* from "Moritzburg" which, as Pocock suggests, may mean Pietermaritzburg.

The distribution of Solifugae is largely determined by conditions of humidity. They avoid dense forest, but are common in arid regions, and in open bush country, such as that of the Kalahari. I am informed by Mr E. C. Wilmot, who writes from Tsessebe, that a species of *Solpuga* (probably *monteiroi*) may often be seen in the act of climbing trees in search of Cicadas. In the Albany district, they are particularly abundant at Alicedale, a warm locality in the valley of the Bushman's River, where scrub and bush prevail. Mr Frank Cruden has kindly furnished me with the following brief notes on several species found in that locality: *Hemiblossia O'neili* is found on light gravelly soil near the river, on flats broken by occasional thornbushes. They are only seen during the bright sunshine of a summer's day, and then in considerable numbers: they are extremely active, and not easily caught, as they seek refuge in small holes and crevices on the slightest alarm. Specimens may be captured by spraying them with dilute spirits of wine, when the creatures succumb at once.

Blossia unguicornis is never seen in the open during daytime, and when exposed to light immediately seeks cover. They are found under stones on the flats and hill sides.

Solpuga lineatus occurs chiefly among the rhenoster bush and other scrub, but not in dense bush. On a summer's day they may often be seen lying on stones exposed to the sun. They are sometimes found in shallow earth cavities under stones.

Solpuga venator occurs on open flats and in broken scrub land. During daytime it takes cover under large stones, but at night may enter houses.

At Grahamstown I have only found one species, *S. derbiana*. It occurs on the open flats above the town, frequenting grass veld as well as stony lands covered with rhenoster bush and other short scrub. During winter months these creatures hide below ground: they emerge in numbers during the bright sunny days of October. Rapidity of movement is their characteristic habit: they run along the ground: they climb the low bushes with ease, at times swinging from twig to twig like long-limbed apes: they are expert burrowers, using the chelicerae as digging organs. Despite their speed they are said to fall a ready prey to kestrels.

The following notes are taken from a little-known paper entitled "Some Arachnids at Hanover, Cape Colony," by S. C. Cronwright-Schreiner, in the *Popular Science Monthly* for December 1902: "If you watch a *Solpuga* closely, you may see its sides palpitating rapidly, even violently, if you hold it in your hand. Like all active, high strung, quick breathing creatures, the Solifugae perish almost instantaneously when immersed in spirits, while large scorpions and large Harpactirae will live for two or three hours. They are great burrowers, but do not make regular holes apparently, and they lie dormant underground during the winter. They are a feature of the thirsty veld and the blazing sun. The 'Tommies' along the railway sometimes make one of these creatures fight with a scorpion. They place the combatants in some slippery vessel so that they cannot run out. The scorpion is nearly always much the larger and heavier and has in addition to its long arms and powerful nippers, a deadly sting. Yet it not infrequently happens that the jacht-spinnekop comes off victorious, for it seizes the scorpion in its terrible shears and tears a huge hole in it with a quickness and force against which the scorpion is often powerless. When one first sees a *Solpuga* on the veld, especially the commonest (*S. chelicornis*), one can hardly believe it is not a beautiful karoo flower: touch it, and away it darts. The Dutch call them Jacht Spinnkoppen or Haar Scheerders. Jacht Spinnkop (hunting spider) is a very appropriate name, for, to the casual observer they resemble spiders, and they are mighty hunters. Haar Scheerder (hair shearer) is even more appropriate. They are called Haar Scheerders because of their two enormous shears. Many a person believes that, if they get into your hair, you will not get them out again until they have shorn it all off."

The S. African solifuge fauna is noteworthy for the abundance of diurnal types. Text-books of Zoology and Natural History describe these creatures as wholly nocturnal, and indeed this seems to be actually the case in other parts of the world. In Dr F. Werner's paper on "Scorpions and Allied annulated spiders of the Anglo-Egyptian Sudan" and in Mr Pocock's account in the *Fauna of British India*, the whole fauna is represented as nocturnal.

The following arrangement of the subfamilies and of the several genera in each subfamily has no claim to phylogenetic importance. The subfamily Solpuginae seems to be quite sharply separated from the other groups and I regard it as the most specialised. The Daesiinae constitute a natural group of which *Daesia* is probably the most specialised genus: this subfamily presents certain points of affinity with the Galeodidae. The Karschiinae have relationships therewith, yet are well worthy of distinction in my opinion, although Prof. Kraepelin finds difficulty in separating them from the Daesiinae: the subfamily includes the most primitive of S. African Solifugae, and indeed the genus *Lipophaga* would appear to be the most generalised of all known Solifugae. The very specialised *Hexisopodinae* are somewhat isolated and their affinities obscure but it does not seem necessary to separate them as a family distinct from the Karschiinae and Daesiinae.

Key to the Genera of South African SOLIFUGAE.

A. Fourth leg with a pair of well-developed terminal tarsal claws. These claws are somewhat larger than those on the preceding legs. The femora of the legs are all long, much longer than the trochantin.

a. First leg without tarsal claws¹.

a₁. Tarsus of fourth leg with seven segments, of which the basal one is by far the longest, being quite as long as the next four segments together, the three penultimate segments being the shortest: tarsi of second and third legs with only four segments: subungual appendages of the tarsal claws small and not strongly divaricating. *S. f. Solpuginae.*

Subfamily SOLPUGINAE.

1. Tarsus of palp immovably attached to the tibia, which segment becomes somewhat narrowed distally and on its inferior surface is armed with numerous short truncated bristles and longer pointed ones but no true spines, also in the male often with a very distinct scopula of short feathered hairs: coxa of palp with an elongated maxillary process projecting anteriorly from the ventral border mesially: ocular tubercle bearing a number of stiff bristles or weak spines, several pairs of approximately equal size being directed anteriorly (in juveniles one pair of forwardly directed spines is noticeably larger than the others): anterior border of head-plate straight and the mesial longitudinal groove more or less obsolete in adults: the glabrous area on the mesial surface of the basal part of the chelicera bearing a series of parallel stridulatory ridges, which however are occasionally absent in adult males: the dental series of the upper jaw flanked on the inner surface and sometimes almost hidden by a strip of numerous feathered bristles, and parallel thereto but situated at a little distance posteriorly is a row of forwardly directed sharp-pointed stout spines, usually 7-9 in males, but more numerous in females: dentition of upper jaw variable in the single series, but the lower jaw has always two large teeth with one (rarely two or three) intervening small tooth; surfaces of body hairy, with stiffer setae on the chelicerae and head-plate; in the male long spines often occur on the chelicerae, but never on the tergites: flagellum of adult male with a stiff shaft exhibiting great variety in shape, generally cylindrical or more or less flattened into a ribbon; this arises from the basal enlargement, a hollow closed capsule, usually flat on the mesial side and turgid on its external side, and fixed immovably along its base to the upper or inner surface of the upper jaw: the walls of the capsule are thickened along the dorsal and hind margins, and the cavity is continued as a fine tubule into the procurrent portion of the shaft which remains firmly attached to the surface of the jaw up to the point where the shaft bends upwards. (Species usually of large size.)

Solpuga Licht.

2. Similar to *Solpuga*, but the tibia of the palp in the adult male carries a number of stout spines on its inferior surface as well as a scopula, which is not large: ocular tubercle armed with two semicircular series of stiff bristles, the two largest of which project horizontally forwards.

Zeriassa Pocock.

¹ According to Kraepelin, rudimentary claws may occur in *Glwiopsis*.

*a*₂. Tarsus of second and third legs with 1-2 segments, of fourth leg with 1-4 segments. Stridulatory ridges of chelicerae long and well developed. Flagellum of male when present is membranous and expanded, at least in its basal portion, the edges incurved to form an open capsule: at the base where it is attached to the mesial surface of the jaw, there is a ball and socket joint by which it can be movably articulated in a vertical plane around its point of attachment. Anterior border of head-plate not quite straight but more or less curved. *S. f. Daesiinae.*

Subfamily DAESIINAE.

3. Second and third legs with two tarsal segments, fourth leg with four tarsal segments, the basal one of which is subequal to the other three in length, the one next to it being shortest, and the most distal segment longer than the penultimate or the antepenultimate. Tibia of second leg with five dorsal spines, of third leg with three dorsal spines. Tarsus of palp slightly movable. Tibia of palp without cylinder bristles or scopula inferiorly but with short spines on each side, three externally and 1-3 internally as well as several longer weak spines and bristles. Maxillary process of coxa of palp very short and rounded. Dentition of female very like that of *Solpuga venator*: of male very variable. The surfaces of the body are not spiny but covered with hairs and long setae which may be spiniform on the upper surface of the chelicerae and on the hind border of the head-plate of adult males. Adult male with a rotatable flagellum, and with a group of numerous modified hairs on the second sternite. Species of moderate size and plain colouration, strongly contrasting colours being unknown in this genus. *Daesia* Karsch.

4. Tarsus of second and third legs composed of only one segment, of fourth leg comparatively long and slender, composed of two segments the distal one of which is much the shorter and is quite freely movable. Tibiae of second and third legs without a dorsal row of spines. Head-plate with a very distinct mesial groove, and armed usually with short spines, prickles, and forked bristles, whilst the upper surfaces of the chelicerae and the tergites, especially those of the thorax, are armed with stiff setae and cylinder bristles the longer ones of which are forked at the tip, or in the male with spines which are often very strong, the first thoracic tergite constituting a narrow spiny collar to the head-plate. Ocular tubercle with two stiff bristles projecting horizontally forwards. Tibia of palp inferiorly with spines and numerous cylinder bristles: short cylinder bristles, or long ones forked at the tip, occur also on the surfaces of the body and appendages generally. Maxillary lobe of coxa of palp fairly long and prominent. Adult male with a membranous rotatable flagellum, and there are several pairs of modified fleshy hairs on the second abdominal sternite in the male and sometimes also in the female. Species of small size and plain colour (except *B. obscura*). *Blossia* Simon.

5. Similar to *Blossia*, but flagellum of male is a flexible densely hairy rod, not rotatable but directed forwards and hidden between the chelicerae. Patella and tibia of palp without spines inferiorly. Ocular tubercle with a semicircle of fine setae on the mesial side of each eye. Anterior margin of head-plate almost semicircular. Upper jaw of male strongly compressed laterally, forming a vertical lamina except quite at the base.

Melanoblossia Purcell.

6. Tarsus of fourth leg comparatively stout, especially in the female, with one or two segments, but in the latter case the two segments are subequal in length and not movably articulated with each other. Patella and tibia of palp without true spines below, the tibia being thickly studded all round with brownish black truncated cylinder bristles. Chelicerae of male without spines above, but with long slender curved bristles. Flagellum of male a large flat rigid membrane rotatable at its narrow end, bearing on its mesial surface a delicate capsule with long slit-like opening, and terminating at its broader end in slight exfoliations, two of which are more or less like short horns: second and third sternites with numerous fleshy hairs. Species of small size and with strongly contrasting colours. *Hemiblossia* Kraepelin.

7. Similar to *Hemiblossia*, but patella and tibia of palp in both sexes with stout spines below in a double row. Tarsus of fourth leg comprising only one segment, which is comparatively slender (5-6 times as long as deep). Flagellum membranous, forming an inflated capsule open along its mesial side. Second and third sternites of male each bearing two clusters of several modified fleshy hair structures. *Gluwiopsis* Kraepelin.

b. Tarsus of first leg with a pair of small or minute tarsal claws. Flagellum of male when present rotatable (or fixed apparently in some species). *S. f. Karschiinae*.

Subfamily KARSCHIINAE.

8. Tarsi of legs II-IV with two freely movable segments, the basal one five or six times as long as the distal segment, which has very long, strongly diverging, subungual appendages. Tibiae of legs II and III spined dorsally, but leg IV without spines. Tibia of palp more or less cylindrical, not attenuated distally, and without true spines or scopula inferiorly, the patella with five very long bristles on each side inferiorly. Upper surfaces of chelicerae and body without strong spines. Anterior margin of head-plate rounded. Ocular tubercle armed with a number of fine bristles especially in front. Basal enlargement of flagellum small and not very sharply differentiated from the shaft, attached by a fairly large rotating joint (sometimes fixed?) to the inner surface of the jaw, and produced directly upwards into the shaft: basally, it is protected and more or less concealed on the mesial side by a fan-like row of feather bristles or by several spines. Upper lobe of rostrum evenly pointed at the apex, the lower margin being not horizontal but inclined upwards. Coxa of palp with a short maxillary process. *Ceroma* Karsch.

9. Similar thereto, but adult male without a flagellum. Upper lobe of rostrum unevenly pointed, the lower margin being horizontal and very slightly concave, and the upper margin curving strongly downwards. *Toreus* Purcell.

10. All the legs with a single tarsal segment and small pulvillus. The two halves of the genital sternite of the female not united mesially. Adult male without a flagellum and no fleshy hairs on the second abdominal sternite. Patella of palp with strong spines inferiorly in the male: tibia of palp with numerous truncated cylinder bristles inferiorly especially in the male. Ocular tubercle with a pair of spines anteriorly. Tibia of leg IV with slender spines inferiorly in the male: of legs II and III with four or five stout dorsal spines also. *Lipophaga* Purcell.

B. Fourth leg without tarsal claws. All the legs are short, the posterior three pairs very robust, their more distal segments strongly spined. In the fourth leg the combined length of coxa and of the three trochanter segments is about equal to that of the rest of the limb, the femur of this leg being shorter than the trochantin. Surfaces of body and appendages clothed with long silky hairs. Flagellum of male rotatably attached at the small cup-like basal enlargement to the inner surface of the upper jaw.

S. f. Hexisopodinae.

Subfamily HEXISOPODINAE.

11. The three distal segments of leg IV are terete, or only slightly compressed, and without angular edges. Pedipalps not spined. Stridulatory area of chelicerae with parallel ribs. In females, the mesial surface of the chelicera carries feathered bristles and stout simple bristles, but the males are devoid of feather bristles and have no long simple bristles, though dorsally near the base of the fang there occurs a dense patch of short spiniform setae. The flagellum of the male is hidden between the mandibles, being attached to the jaw far back, but quite near to the cutting edge and not far from the angle of the jaws.

Hexisopus Karsch.

12. The three distal segments of the fourth leg are broad and more or less strongly flattened with angular edges, and some of the distal segments of the third and fourth legs have their posterior surfaces hairless and densely covered with short granuliform or dentiform spinules. Distal segments of pedipalps strongly spined. Inner surface of chelicerae with a large smooth area marked with fine furrows, which are sometimes more or less reticulately arranged, and sometimes more or less in longitudinal lines. (Females of this genus unknown.)

Chelypus Purcell.

Genus Solpuga Licht.

Solpuga lethalis C. L. Koch, 1842 [Text fig. 2 a]. Kraepelin, in *Das Tierreich*, p. 56, fig. 14. Purcell, in *Annals S. Af. Mus.* 1, p. 405, figs. 19 and 19 a.

The form described by Dr Purcell, characterised by a well-marked distal sinus on the shaft of the flagellum, was recorded from the following divisions in Cape Colony: Malmesbury, Robertson, Swellendam, Paarl, Worcester, Clanwilliam and Namaqualand. In this form, now termed *S. lethalis typicus*, the shaft is devoid of minute serrations except for an oblique band on the anterior half of the sinus.

Kraepelin records the species from various localities in S.W. Africa, viz. Ababis, Okasise, Okahandja, Windhuk, Rehoboth and Spitzkoppe near Keetmanshoop. It is not known from the eastern or central districts of the Cape Province.

In the male, the spines on the upper surfaces of the chelicerae are not very stout.

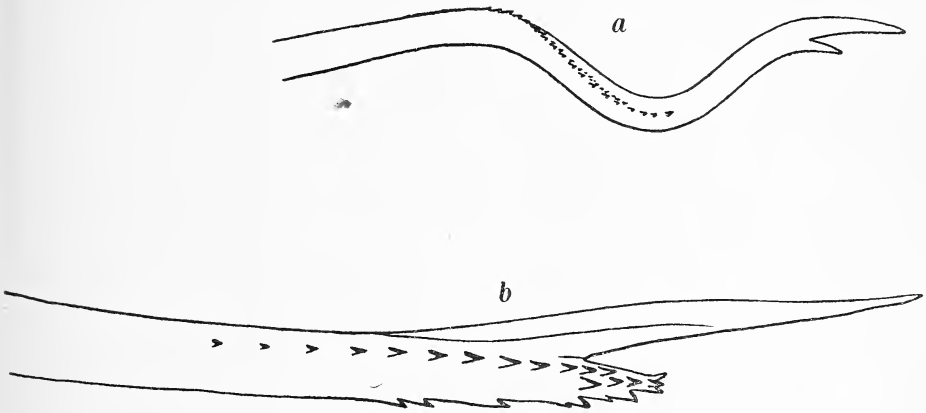
Solpuga lethalis C. Koch var. nov. *rectus* [Pl. VII, fig. 37 and Text fig. 2 b].

This name is applied to a form which is chiefly distinguished from typical specimens, as described by Kraepelin and Purcell, in the complete absence of a distal sinus on the recurrent portion of the flagellum. The shaft is long,

extending back well beyond the ocular tubercle, approximately reaching the middle of the head-plate: apically it is bifurcated, the upper portion being longer, quite smooth and tapering to a point, the lower portion being short, blunt, and its surfaces well serrated along the angular margins. The shaft is also serrulated along the slight ridges which occur in its basal half, but in the distal half, where ridges are still more marked, the serrations are absent excepting near the apex: the surfaces are in fact comparatively smooth in the distal half but roughened in the basal half.

The anterior bend of the flagellum is approximately midway between the apex of the fang and the first tooth. On the inner upper margin of the fang, near to the anterior bend, there is a small tooth.

Measurements. Breadth of head-plate 11, length of patella of palp 17.8, of tibia and tarsus of palp 17.5, of patella of fourth leg 16. Total length of recurrent portion of flagellum 16.75.



Text fig. 2, *a* and *b*. *Solpuga lethalis* Koch. *a*, Distal portion of flagellum of typical form from O'okiep, viewed from the outer side inferiorly. *b*, Ditto of *S. lethalis* var. nov. *rectus* from Windhuk: more enlarged than *a*.

The type of this variety is a single male example from Windhuk (G. A. Thompson), in the collection of the Transvaal Museum.

This form was evidently known to Prof. Kraepelin: in his last paper (3) some reference was made to the variability of the flagellum in this species and *venator*, but unfortunately no locality data were given for the varietal forms there mentioned.

Solpuga venosa Purcell, 1899. *Annals S. Af. Mus.* 1, p. 412, figs. 18 and 18 *a*.
Kraepelin, in *Das Tierreich*, p. 74, fig. 41.

The type was taken from a locality about twenty miles east of Pietersburg, Zoutpansberg dist.

Solpuga furcifera Kraepelin, 1899. *Das Tierreich*, p. 79, fig. 56.

Kraepelin cites the following localities in the northern parts of S.W. Africa: Osire, Windhuk, Rehoboth, Walfish Bay. A description of the female is given by the same author (2).

Solpuga fusca C. L. Koch, 1842 [Pl. VI, fig. 26]. Purcell in *Annals S. Af. Mus.* 1, p. 417, figs. 22 and 22 a. Kraepelin in *Das Tierreich*, p. 79, fig. 54.

This species is recorded by Purcell only from localities in the Cape Peninsula. It may be noted that Kraepelin's figure in *Das Tierreich* does not agree with Dr Purcell's account in regard to the position of the anterior bend of the flagellum.

Solpuga toppini Hirst, 1916. *Annals Durban Mus.* 1, p. 228, fig. 15.

The type is from Ngxwala Hill, Ubombo, Zululand.

The Durban Museum has several large females from the same locality which are probably referable to this species. The general colour in spirits is a dirty brown with olivaceous tinge, the chelicerae especially somewhat greenish, tergites all blackish, malleoli dark-edged. The single series of teeth in the upper jaw with two small intermediate teeth. Genital sternite with broadly rounded posterior margins. There is a stronger development of fine hairs on the palp and legs than in females of the *venator* group, and the head-plate is rather more hirsute. Measurements: breadth of head-plate 12.5, length of tibia and tarsus of palp 11, of patella of palp 10.3, of patella of fourth leg 10.2, of tibia of fourth leg 9. These females are well separated from those of *fusca*, to which *toppini* seems to be related, in that the dentition of the lower jaw is quite normal for the genus.

Solpuga venator Pocock [Pl. I, fig. 1 and Pl. IV, fig. 12], 1897. *Ann. Mag. Nat. Hist.* 6, xx, p. 258, fig. 7. Purcell in *Annals S. Af. Mus.* 1, p. 407 and 11, p. 208.

The type of this species came from Kleinpoort in the Eastern Karroo, and specimens from Port Elizabeth were identified therewith by Mr Pocock.

Recorded by Purcell from the following divisions in Cape Colony: Namaqualand, Kenhart, Carnarvon, Victoria West, Middelburg, Beaufort West, Prince Albert, Sutherland and Uitenhage; also from Warmbad in Great Namaland. It is known to me from: Brakkloof near Grahamstown (Mrs G. White); Alice (Albany Mus. coll.); Grattans, Koonap (E. Bennett); Carlisle Bridge (F. Bowker); Alicedale (F. Cruden); Longhcepe (Miss D. Cotton); De Aar (S. C. Cronwright-Schreiner); Griquatown (Dr R. Broom); Aus S. W. A. (female examples in Kimberley Mus.). Kraepelin records it from the following localities in S. W. Africa: Warmbad, Churutabis, Keetmanshoop, Kabus, Kuibis, Luderitzbucht, Gibeon and Rehoboth.

The spines on the upper surface of the chelicerae are not so strongly developed as in *monteivoi*. A large female from Keetmanshoop (G. V. Haagner), in the collection of the Transvaal Museum, has the following measurements: Width of head-plate 15, length of patella of palp 16, of tibia and tarsus of palp 17, of fourth patella 14.75, of fourth tibia 13.3. This specimen has a single intermediate tooth in the single series of the upper jaw. In a male from Dunbrody the single series of teeth in the upper jaw comprises four main teeth, but on the fourth basally there is a distinct additional tooth: in specimens from Redhouse a minute additional tooth occurs between the second and third normal teeth. A large female example from Griquatown sent along with an adult male of *venator* has two such intermediate teeth, whereas the male has only one: this female may be referable to *lethalis*, but the dentition cannot be regarded as an infallible guide in distinguishing these two species.

A female from Douglas has a single intermediate tooth; males from the same locality may have one such tooth or two, in which case one of them is very small.

Solpuga monteiroi Pocock, 1895 [Pl. VII, fig. 38]. *Ann. Mag. Nat. Hist.* 6, xvi, p. 87. Pl. IV, fig. 6 (figure erroneous). Also *Ann. Mag. Nat. Hist.* 6, xx, p. 257, fig. 6 on p. 261.

The author's second figure was also incorrect in its representation of the spiny armament of the chelicera.

The type came from Delagoa Bay. Kraepelin records it from Walfish Bay, and from other localities in the northern portion of South West Africa, viz. Windhuk, Okahandja, Okakena, Osire, and Grossfontein. I have recorded it from Victoria Falls, and it is also known to me from: Mt Temple, Bechuanaland (T. C. Lanham); Rooikranz, Rustenburg dist. (Transvaal Mus.); Vygeboompoort in Waterberg dist. (G. van Dam); Tsessebe (E. C. Wilmot); Kraai Pan (Kimberley Mus.); Griffin Mine, Leydsdorp (G. van Dam); and Newington in N. E. Transvaal (Dr J. P. Fenoulhet).

The distribution of this species appears to agree closely with that of the scorpion *Uroplectes vittatus* Thor.

Specimens from Mt Temple have a straight flagellar shaft, whilst those from Tsessebe have a shallow sinuation thereon at a little distance from the apex. In one example from the former locality, the basal enlargement of the flagellum is not so elongate as in typical examples and the spines on the chelicerae not so strong.

Female examples apparently referable to this species are distinguishable from those of *venator*, *globoicornis*, and allies, from the fact that the patella and tibia of the fourth leg are subequal in length: moreover the cylinder bristles on the palp are comparatively few, the tarsus being devoid thereof and the femur having only very few such bristles.

Solpuga schlechteri Purcell [Pl. IV, fig. 15], 1899. *Annals S. Af. Mus.* i. p. 411, figs. 17 and 17a.

The type came from Naroep in Great Bushmanland. In *Das Tierreich*, Prof. Kraepelin suggested that this may be cospecific with *serraticornis*: it is clear however that such is not the case, and in Kraepelin's most recent list the species is maintained on the evidence of specimens from Luderitzbucht and Kuibis, which differ from Purcell's description only in possessing a single intermediate tooth, instead of two, in the upper jaw. We have the species from Kakamas (Miss H. C. Olivier), and from Keimoes near Upington (S. M. Gadd). In the Keimoes example there is a single intermediate tooth in the upper jaw: in the Kakamas specimens two such teeth are represented, although the second tooth is either a mere rudiment or only minute.

The feather bristles of the upper jaw are not strongly developed: they are comparatively numerous on the lower jaw.

Solpuga serraticornis Purcell, 1899. *Annals S. Af. Mus.* i. p. 409, fig. 16.

The type came from the neighbourhood of Bulawayo.

Adult specimens from Bulawayo have been kindly lent to me by Dr G. Arnold. In both sexes the dorsal surfaces are somewhat infuscated, but not deeply so, the pigmentation extending over the soft skin for some little distance lateral to the tergites. In the male the spines on the upper and lateral surfaces of the chelicerae are numerous and long, but not very stout: the upper margin of the basal enlargement of the flagellum is curved, not greatly elongated.

In the female there are two intermediate teeth in the single series of the upper jaw: cylinder bristles occur on the patella, tibia, and tarsus of the palp, but not many on the patella.

Measurements of adult female. Breadth of head-plate 14, length of patella of palp 12, of tibia and tarsus of palp 12.5, of patella of fourth leg 11.2, of tibia of fourth leg 10.1.

A variety of this species, found at Umtali, was described by me under the name of *S. serraticornis umtalica* (*Annals Transvaal Mus.* IV. p. 162, fig. 24). We also have the species from a locality in the south of the Melsetter dist. (F. A. O. Pym).

In *umtalica* the upper margin of the basal enlargement of the flagellum is curved: there are numerous well-feathered bristles on the lower jaw, and the distance from the tip of the fang to the apex of the first tooth is equal to $1\frac{1}{3}$ – $1\frac{2}{3}$ times the distance between the two large teeth: there is a dense group of long and strong spines on the upper and outer surfaces of the chelicera.

Solpuga spiralicornis Purcell [Pl. V, fig. 18], 1903. *Novitates Zoologicae*, x. p. 304, fig. 1.

The type came from Shilowane, near Leysdorp. What seems to be the same species was described by Mr S. Hirst from the Zoutpansberg dist., under the name of *S. pugilator* (*Ann. Mag. Nat. Hist.* 8, IX. p. 232). It is known to me from Newington (Dr J. P. Fenoulhet), and the Transvaal Museum has it from Hectorspruit (F. Streeter), and Griffin Mine, Leysdorp (G. van Dam).

In this species the form of the basal enlargement varies somewhat. In the Newington specimen the upper margin of the basal enlargement is quite long and practically straight: in the Griffin Mine example it is a little shorter, and distinctly curved on the upper margin. Moreover, in the latter, the terminal portion of the shaft beyond the sinus is not so sharply pointed nor so straight as in our Newington example. The Griffin Mine form is presumably typical: that from Newington and Hectorspruit is apparently the same as *pugilator* Hirst, which may thus rank provisionally as a varietal form.

The characters of the lower jaw, however, seem to separate these forms a little further: in the Newington example, the fang is distinctly longer than in other specimens, the distance from the tip to the apex of the first tooth being equal to $1\frac{1}{2}$ times the distance between the apices of the two large teeth, whereas in examples from Griffin Mine and Hectorspruit the proportion is $1\frac{2}{3}$ times. In each case there are numerous well-feathered bristles on the lower jaw.

A female example probably referable to *spiralicornis* was also taken at Griffin Mine by Mr van Dam: I refer it to this species, rather than to *monteironi*, which was taken in the same neighbourhood, on account of the dark pigmentation on the abdomen, a character found in the male of *spiralicornis*. The soft skin between the tergites of the abdomen and thorax is rather deeply infuscated, and on the abdomen this extends to some extent down the sides in the neighbourhood of the first three or four segments: in the hinder half of the abdomen the soft skin of the sides is deeply infuscated over an extensive area and also ventrally between the sternites. The head-plate is brown, dark brown near the anterior margin, the ocular tubercle very darkly so. Palps and legs pale yellowish brown. Malleoli not infuscated. There are two intermediate teeth of moderate size in the single series of the upper jaw.

Measurements. Breadth of head-plate 9.25, length of tibia and tarsus of palp 11, of patella of palp 10.35, of tibia of fourth leg 9.3, of patella of fourth leg 9.7.

Solpuga strepsiceros Kraepelin, 1899 [Pl. IV, fig. 13 and Text-fig. 3]. *Das Tierreich*, p. 68, fig. 31.

The locality cited by Kraepelin is Delagoa Bay. The species is known to me from Barberton (Transvaal Mus.).

In Barberton specimens, the flagellum has a spiral twist, but the spiral is not an open one, and the curves not so pronounced as represented in Kraepelin's figure in *Das Tierreich*. The serrated edge is not continued over the whole length of the shaft, but commences slightly posterior to the hind margin of the basal enlargement. Basal enlargement short, with curved upper margin. On the upper surface of the chelicera there are a few long slender spines and stiff bristles, but the development of stout spines is not nearly so pronounced as in *spiralicornis*, and true spines do not occur on the outer surface of the chelicera.



Text fig. 3. *Solpuga strepsiceros* Kraepelin. Shewing terminal portion of right upper jaw, with flagellum: specimen from Barberton.

The splendid colouration of this species—head-plate, palps, legs and sides of abdomen clothed with bright, golden yellow hairs, tergites black—serves to distinguish the female from those of related species. The margins of the malleoli are broadly infuscated but not deeply so. The measurements of the female are as follows: breadth of head-plate 10·7, length of tibia and tarsus of palp 10, of patella of fourth leg 9, of tibia of fourth leg 7·8.

Solpuga schönlandi Pocock [Text-fig. 4], 1900. *Ann. Mag. Nat. Hist.* 7, vi. p. 316.

The type was recorded from Grahamstown, but there are no specimens in the Albany Museum from the Grahamstown neighbourhood. I have previously recorded it from Kimberley, from the neighbourhood of Johannesburg, and from several localities in the Pretoria district. It is also known to me from Rooispruit near Rosmead (A. Gibbons); Tafelberg (Miss A. Gadd); Damplaats near Burghersdorp (A. Kruger); Vryburg, Warrendale and Kuruman (Kimberley Mus.); Modder Riv. (F. A. O. Pym) and Bulawayo (Miss L. Leppan).

In the male, there may be either five or four teeth in the single series of the upper jaw: in the former case the third tooth is minute. The terminal fang is rather long, curved slightly outwards towards the apex, and a little downwards at the apex: on the inner edge superiorly is a small sharp-pointed forwardly projecting tooth, situated much nearer to the flagellum than to



Text fig. 4. *Solpuga schönlandi* Pocock. Portion of left chelicera of male, viewed from mesial side: specimen from Rooispruit.

the apex of the fang. The lower jaw has no distinct lateral keel on its outer side distally: the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{1}{2}$ – $1\frac{2}{3}$ times the distance between the apices of the two large teeth. The basal enlargement of the flagellum is high, not produced anteriorly: the upper margin is acute, but does not form a sharp keel well marked off from the outer turgid portion: on its outer side it is flanked by a strong chitinous thickening which is continued obliquely downwards into the fang. The shaft is short, lightly curved, considerably flattened at the anterior bend in an antero-posterior direction, but elsewhere is more or less cylindrical, gradually diminishing in width towards the apex, which is truncate with a central projecting core. In dried specimens the shaft bends downwards over the basal enlargement, and thus the apex becomes carried far back, distinctly behind the hind margin of the basal enlargement. There is a fairly strong development of spines and stiff bristles on the upper and outer surfaces of the chelicera. Colour: head-plate and appendages pale yellowish, the front margin of the former infusate: abdominal tergites pale brown: malleoli not infuscated.

The female has four or five teeth in the single series of the upper jaw: upper and lateral surfaces of the chelicera more or less distinctly marked with three darkish longitudinal stripes: hairs of abdomen greyish. This latter character will separate it from the female of *venator* in which the hairs of the abdomen are uniformly lemon yellow.

So far as I can discover, the female presents no structural or colour characters which will serve to distinguish it from *globoicornis* which is common in the Pretoria district, or from *ferox* which occurs in the Free State and Transvaal. However, the relation between the width of the head-plate and the length of the several segments of the fourth leg may perhaps ultimately furnish a guide to the specific identity of adult examples.

Measurements. Total length, M, 41: width of head-plate, F, 12.85: length of tibia and tarsus of palp, M, 13.5, F, 11.85: of patella of palp, M, 13, F, 10.8: of tibia of fourth leg, M, 10.8, F, 9: of patella of fourth leg, M, 11.2, F, 9.6.

Solpuga globoicornis Kraepelin, 1899 [Pl. V, fig. 21]. *Das Tierreich*, p. 76, fig. 47.

This species has been previously recorded by me from various localities in the Pretoria district, and with some doubt from the Lydenburg and Zoutpansberg districts.

In the lower jaw of the male the distance from the tip of the fang to the apex of the first tooth is equal to about $1\frac{2}{3}$ times the distance between the apices of the two large teeth.

In the female, the patella of the fourth leg seems to be always longer than the tibia.

Measurements of several females apparently referable to this species are as follows:

	Width of head-plate	Length of tarsus + tibia of palp	Length of patella of palp	Length of patella IV	Length of tibia IV
Immature example from Pretoria	10.9	11.3	10.4	9.5	8.8
Adult from Gezina ...	12.1	12	11.25	10	9.4
Adult from Wonderboom ...	12.5	11.8	10.65	9.7	9.3

Only very few cylinder bristles occur on the tibia of the female palp: there are some also on the tarsus.

Solpuga sericea Pocock [Pl. III, fig. 6], 1897. *Annals Mag. Nat. Hist.* 6, xx. p. 260, fig. 4.

The types came from Gadzima on the Umfuli River, Mashonaland. Mr S. Hirst records the species from Petauke and from Alala Plateau, localities north of the Zambesi. It is recorded by Dr Purcell from Shilowane.

We have a female example from Salisbury (Fr. J. O'Neil, S.J.) which is probably referable to this species (or possibly to *celeripes* Hirst). There are numerous very long silky hairs on the hind legs, a very unusual character in females: the hairiness of the hind legs is indeed more pronounced than in females of *chelicornis*. The hind borders of the genital sternites are broadly rounded. There are two intermediate teeth in the single series of the upper jaw. Measurements: breadth of head-plate 5·1, length of tibia and tarsus of palp 6·1, of patella of palp 5·5, of patella of fourth leg 5·7, of tibia of fourth leg 5·7.

Solpuga celeripes Hirst [Pl. VI, fig. 32], 1911. *Manchester Memoirs*, LVI. No. 2, p. 10, fig. 2.

The type came from Salisbury, S. Rhodesia. The adult male is the smallest known to me in this genus, the type being 11 mm. long and its head-plate 3 mm. broad. A specimen in the Transvaal Museum has the following measurements: breadth of head-plate 3·1, length of tibia and tarsus of palp 5·7, of patella of palp 5·4, of tibia of fourth leg 5·7, of patella of fourth leg 5·3.

In describing the species, Mr Hirst remarked that the dark markings and general colouration are almost exactly the same as in *S. sericea*, but the narrow yellow stripe which is present on either side of the dark central band of the dorsal surface of the abdomen in *sericea* seems to be absent (the abdomen being shrunken). In the specimens examined by me, however, the continuous yellow stripes are clearly present. The adult male is remarkable for the relative shortness of the fang of the lower jaw, the distance from the tip of the fang to the apex of the first tooth being subequal to the distance between the apices of the two teeth.

Solpuga alstomi Purcell, 1901. *Annals S. Af. Mus.* II. p. 209, fig. 1.

The type was taken at Eities in Gt. Bushmanland.

Solpuga darlingi Pocock, 1897. *Ann. Mag. Nat. Hist.* 6, xx. p. 259 and fig. 5, p. 261.

The type came from Gadzima on the Umfuli River, Mashonaland.

Solpuga ferox Pocock [Text fig. 5], 1895. *Ann. Mag. Nat. Hist.* 6, xvi. p. 83, Pl. 4, fig. 3. (Kraepelin's figure in *Das Tierreich* (p. 71) represents the characters of the male chelicera more correctly than that accompanying Pocock's original description, but is also somewhat misleading.)

The type is labelled Port Elizabeth, but the record requires confirmation in my opinion. The species has been recorded by me from Kimberley and Rustenburg, and I know of it also from Venterskroon (M. H. Viljoen); Kroonstad (Miss D. Chennells); and Bloemfontein (Dr T. F. Dreyer). The Kimberley Museum has it from Fourteen Streams, Barkly West, Taungs, Pniel, and Wirsing Siding as well as from Kimberley.

The male has a distinct keel on the outer side of the lower jaw distally.

Solpuga sagittaria Pocock, 1900. *Ann. Mag. Nat. Hist.* 7, v. p. 299, figs. 5 and 5 a. See also *Das Tierreich*, p. 74, figs. 42 and 43.

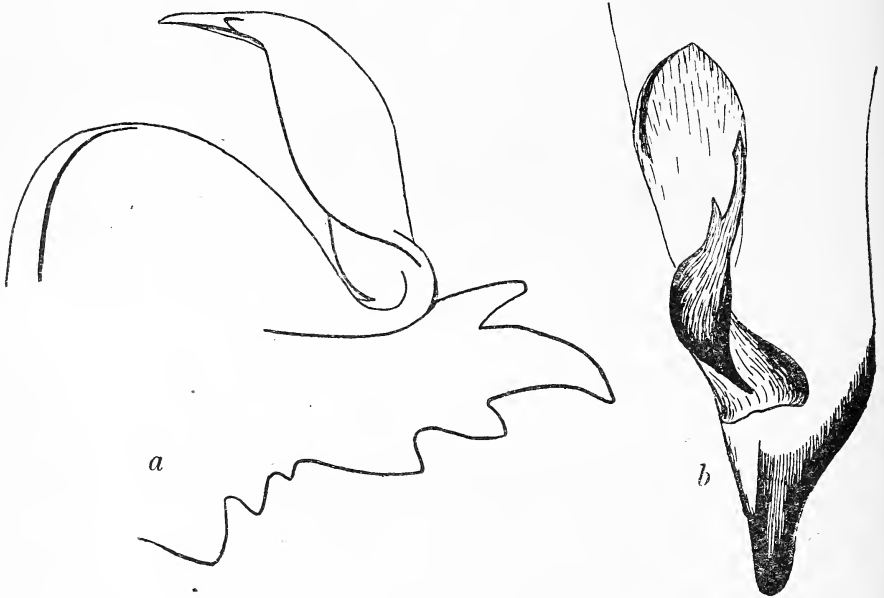
The locality cited for the type is Mazoë, Mashonaland.

Solpuga suffusca Hewitt [Pl. V, fig. 22], 1916. *Annals Durban Mus.* I. p. 217.

The locality of the type is unknown. In both upper and lower jaw there is an exceptionally strong development of feather bristles. The fang of the lower jaw is short, the distance from the tip to the apex of the first tooth being about equal to $1\frac{1}{3}$ times the distance between the apices of the two large teeth.

Solpuga cervina Purcell, 1899. *Annals S. Af. Mus.* I. p. 415, figs. 21 and 21 a, also II. p. 208.

The type came from Clanwilliam: other specimens were recorded by Purcell from Steinkopf in Namaqualand, and females apparently referable to this species from Van Wyk's Vlei and from Namies in Bushmanland.



Text fig. 5. *Solpuga ferox* Pocock. Shewing flagellum and terminal portion of left upper jaw viewed (a) from the mesial side, (b) from the dorsal side: specimen from Kimberley.

Solpuga alvicornis Kraepelin [Pl. VII, fig. 34], 1914. *Beit. z. Kennt. Land- u. Süsswasserfauna Deutsch-Südwestafrikas, Skorpiones u. Solifugae*, p. 125, fig. 2.

The type came from Keetmanshoop. It is also known to me from the neighbourhood of Kuruman (F. A. O. Pym) and Mt Temple (T. C. Lanham).

In the Kuruman specimens, the flagellum, and with it the terminal fang of the upper jaw, is twisted outwards away from the main axis of the jaw. The basal enlargement is high and swollen. There are long stridulatory ridges on the chelicerae. The upper surfaces of the chelicerae bear long stout bristles but no definite spines. The fang of the lower jaw is short, the distance from the tip to the apex of the first tooth being about $1\frac{1}{3}$ times as long as the distance between the apices of the two large teeth.

Solpuga collinita Purcell, 1903. *Annals S. Af. Mus.* III. p. 3, fig. 2.

The type came from Willowmore C. P.

Solpuga vineta C. L. Koch, 1842. Kraepelin, *Das Tierreich*, p. 63, fig. 23. Purcell, *Annals S. Af. Mus.* I. p. 420, fig. 23.

It is recorded by Dr Purcell only from the neighbourhood of Capetown.

Solpuga maraisi Hewitt [Pl. V, fig. 23], 1913. *Records Albany Mus.* II. p. 480, Text fig.

The type came from Caledon C. P. The species is also known from Worcester (G. B. Townshend), and Stellenbosch (C. S. Grobbelaar). On the outer side of the lower jaw, a keel is present near the apex of the fang, but more proximally the lateral crest is obsolete. The feather bristles of the upper and lower jaws are weakly developed. The fang of the lower jaw is not greatly elongated, the distance from the tip of the fang to the apex of the first tooth being about twice, or a little less than twice, the distance between the apices of the two large teeth. Stridulatory ridges are moderately well developed on the upper jaw:

Solpuga spectralis Purcell, 1899. *Annals S. Af. Mus.* I. p. 424, fig. 25.

The type specimen came from Klipfontein, Namaqualand division.

Solpuga lateralis C. L. Koch [Pl. V, fig. 24], 1842. Kraepelin, *Das Tierreich*, p. 61, fig. 19. Purcell, *Annals S. Af. Mus.* I. p. 425, fig. 26.

Dr Purcell records this species from Port Elizabeth. It is known to me from Dunbrody (Fr. Vogt), and from Bussacks near the Kareiga River mouth (Mr F. G. C. Graham).

In males of this species, the stridulatory ridges of the upper jaw are rather weakly developed, sometimes being nearly obsolete. The fang of the lower jaw is moderately elongated, the distance from its tip to the apex of the first tooth being equal to about $2\frac{1}{3}$ times the distance between the apices of the two large teeth. The fang of the upper jaw is without a keel on its mesial side, as occurs in *hostilis* and *derbiana*, but the keel is represented by a prominent sharply pointed tooth.



Text fig. 6. *Solpuga erythronotoides* sp. nov. Dentition and flagellum of male, viewed from the mesial side.

Solpuga erythronota Kraepelin, 1900. *Das Tierreich*, p. 64, fig. 24.

The type of the species is indefinitely located S. Africa.

Solpuga erythronotoides sp. nov. [Text fig. 6].

This species is founded on a single male example found at Victoria West by Mr B. Marais. It is very closely related to *S. erythronota* Kraepelin, but

seems to differ as follows: the flagellum is shorter and its anterior bend more forwardly situated: there is a distinct interval between the first and second teeth of the lower jaw.

Dentition. The terminal fang of the upper jaw is short: there are three distinct anterior teeth, the first being small and the second and third of moderate size: there follows a long toothless interval terminated by the fourth tooth which is small and the fifth which is large but not much larger than the third: in the double series, the outer row has four teeth but the inner one only three, of which the distal one is largest. On the inner side of the jaw dorsally, near to the terminal fang and just in front of the anterior bend of the flagellum, is a prominent sharp pointed tooth terminating an abbreviated keel or ridge. The lower jaw has three teeth, the distal one largest and longest and separated from the small intermediate tooth by a short interval. On its outer side, a sharp lateral keel is only present in the distal fourth, whence it is continued as a line of granules to the base of the jaw. The distance between the tip of the fang and the apex of the first tooth is equal to about $2\frac{1}{2}$ times the distance between the apices of the two large teeth.

Flagellum. The basal enlargement is well elevated and has a sharply keeled dorsal margin: anteriorly it is only a little produced, the anterior bend being situated above the third tooth: the recurrent portion is sub-cylindrical and slender, except at the anterior bend where it is strongly flattened from front to back though not quite so broad as the fang at this point: it passes in a light curve immediately above the basal enlargement, and, twisting slightly outwards, terminates in an acutely pointed apex a little posterior to the hind margin of the basal enlargement; the length of the flagellum occupying a post-laminar position being much less than the distance between the anterior bend and the hind margin of the lamina.

The stridulatory area of the chelicera is well developed.

Colour. Head-plate and appendages pale brown: tibia and more distal segments of fourth leg dark brown, and the distal segments of the other legs and of the palp are also more darkly coloured than the basal segments: abdominal tergites pale brown with some infuscation laterally, but there is no strongly contrasting pigmentation on the tergites: sides of abdomen clothed with long pale hairs: malleoli broadly margined with black.

Measurements. Total length 23, length of flagellum 1.7, of patella of palp, 5.4, of tarsus and tibia of palp 6.2, of patella of fourth leg 5.75, of tibia of fourth leg 5.2.

This species, and its near ally *erythronota*, are nearly related to *S. lateralis*.

Solpuga derbiana Pocock [Pl. II, fig. 4 and Text fig. 7], 1895. *Ann. Mag. Nat. Hist.* 6, xvi. p. 90, Pl. IV, fig. 8.

The type is labelled "Interior of S. Africa." Dr Purcell has identified therewith a species common at Grahamstown, and the information kindly supplied to me by Mr S. Hirst regarding the characters of the type specimen seems to confirm the identification. The species is known to me from Grahams-town, Brakkloof (Mrs G. White), Peddie and Line Drift near Peddie (B. Marais), Majuba Nek, Herschel dist. (J. Hepburn), and Damplaats near Burghersdorp (A. Kruger).

The length of the recurrent portion of the flagellum is greater than twice the distance from the anterior bend to the hind margin of the basal enlargement: and the tip of the flagellum reaches to a point situated very much

nearer to the hind dorsal margin of the chelicera than to the hind margin of the basal enlargement. The length of the flagellum will probably prove to be somewhat variable, but I have not yet seen material that can be regarded as intermediate between this species and *coquinae*, which is mainly distinguished therefrom by its shorter flagellum.

The basal enlargement of the flagellum is considerably elongated, and the anterior bend, which is not markedly broadened, lies immediately over the second tooth, or even very slightly anterior thereto. The shaft is subcylindrical almost throughout, but towards the tip there suddenly appears a dark brown sharp cutting edge dorsally: this is usually very slightly raised above the rounded surface of the main portion of the shaft, but to a variable extent, the cutting edge being more prominent in Peddie specimens than in examples from Grahamstown, and is scarcely visible in a specimen from Brakkloof near Grahamstown. The terminal fang of the lower jaw is not long, the distance from its tip to the apex of the first tooth being equal to about $1\frac{3}{5}$ – $1\frac{4}{5}$ times the distance between the apices of the two large teeth.

In the female the anterior tergites are reddish brown, becoming dark brown or nearly black near their lateral borders: in the sixth tergite the



Text fig. 7. *Solpuga derbiana* Pocock. Showing flagellum and terminal portion of left upper jaw viewed from mesial side: specimen from Peddie.

posterior border is also infuscated, and succeeding tergites are quite black. Sides of abdomen with pale hairs. Sternites dark brown at their lateral margins, but only very narrowly so anteriorly, and more broadly so in the posterior sternites. Hind legs red, chelicerae reddish, and head-plate with a red tinge. In the male the general colour is dull brown and the tergites are very dark, black behind and at the sides: mesial portions of six anterior tergites brown. Hind limbs brown, with well developed mane, the hairs thereof white with just a tinge of pale violet. Scopula of palp rufous. Sides of abdomen whitish.

A subadult male, lacking the flagellum, taken in Grahamstown (15. xii. 1918), greatly resembles the female in colour: it differs therefrom in the well developed mane of the hind leg, and the sides of the abdomen are whiter than in the female.

Measurements of adult male from Peddie and of adult female from Grahamstown: breadth of head-plate, M, 7.1, F, 8.6: length of patella of palp, M, 7.7, F, 6.7: of tibia and tarsus of palp, M, 7.8, F, 7.6: of patella of fourth leg, M, 6.9, F, 6.8: of tibia of fourth leg, M, 6.25, F, 6.1.

Solpuga tookei sp. nov. [Text fig. 8].

The type of this species is a single adult male from Mariannhill, Natal, kindly presented to the Albany Museum by the Curator of the Museum at the

Trappists Monastery near Pinetown. It is named after Lt. W. M. B. Tooke to whom the Albany Museum is indebted for the identification and arrangement of the collection of ticks belonging to that institution¹.

The species belongs to the group including *hostilis* White, and *marshalli* Poc., both of which have been recorded from the Durban neighbourhood (but the latter species quite erroneously, I think). In the Mariannah specimen, the second tooth of the upper jaw is quite large, and the distance from the tip of the fang to the apex of this tooth is subequal to the distance between the apices of the second and fourth teeth: the gap between the second and third teeth is in fact not nearly so long as in *S. marshalli* Pocock or *S. hostilis* White, which latter species it more closely resembles in the characters of the flagellum.

Dentition. Upper jaw with a terminal fang of moderate length, and not upturned: first tooth small, second large, then follows a rather short and shallow gap, third tooth rather small, fourth the largest: in the double series, the outer row comprises three moderate sized teeth and one small one basally situated, whilst the inner row has the first and third teeth of moderate size



Text fig. 8. *Solpuga tookei* sp. nov. Portion of left upper jaw, with flagellum, viewed from mesial side.

but the second and fourth minute. In the lower jaw there is a strong prominent crest on the outer side, extending from apex to base. The two major teeth are both large and the middle one rather small: between the large distal tooth and the small middle one, there is a short but well-defined interval. The fang of the lower jaw is not long, the distance from the tip to the apex of the first tooth being about $1\frac{2}{3}$ times as long as the distance between the apices of the two large teeth. The stridulatory area on the inner surface of the upper jaw is ill developed, the ridges being short and weak, and the whole area decidedly smaller than usual: there are five ridges present and rudiments of two others.

Flagellum. The basal enlargement is moderately elongated; the anterior bend is in the same vertical as the first tooth; the shaft is narrow and sub-cylindrical, passing backwards just above the basal enlargement and extending to a point which is a trifle more remote from the hind margin of the basal enlargement than this is from the tip of the fang, thus not reaching so far as the hind margin of the chelicera. At the anterior bend the flagellum is not broadened, its width being less than half the extreme width of the fang at this point. Near the tip of the flagellum it presents dorsally a sharp cutting edge for a short distance.

¹ Since this was written, my friend William M. B. Tooke, 2nd Lieut. South African Infantry, fell in action at Fampoux, 12th April, 1917.

Palp with the tibia scopulate below except near the base, and only thinly scopulate near the apex.

Posterior legs carrying long hairs but they do not seem to form a definite mane.

Colour. Head-plate, mandibles, and appendages pale brown, the more distal segments of palps and legs dark brown, the infuscation being strongest on the distal segments from the patella onwards of the fourth leg. Abdominal tergites very dark, almost black superiorly throughout, but sides of abdomen clothed with pale yellow hairs. Malleoli not infuscated.

Measurements. Total length 20, length of flagellum 5·2, of patella of palp 5·25, of tarsus and tibia of palp 6, of patella of fourth leg 4·7, of tibia of fourth leg 4·55.

Solpuga coquinae Hewitt, 1914. *Records Albany Museum*, III. p. 9, fig. 2.

The type came from Cookhouse C.P. and we have other specimens from Somerset East (E. Driver), Longhope (E. Abrahamson) and a fairly distinct variety from Kimberley (J. H. Power) and Bloemfontein (Dr T. F. Dreyer).

The flagellum varies a little in length, being a trifle longer relatively in large specimens than in small ones, but the total length of the recurrent portion is never more than twice the distance from the anterior bend to the hind margin of the basal enlargement: the apex is considerably nearer to the hind margin of the basal enlargement than to the posterior dorsal margin of the chelicera. The flagellum is not markedly broadened at the anterior bend.

In specimens from Kimberley and Bloemfontein the flagellum differs only slightly from that of the type, in that the basal enlargement is a trifle deeper, more rounded, and less produced anteriorly, whilst the shaft is a little longer and straighter but sometimes bent downwards rather abruptly near the tip: these minor differences are exhibited more particularly in the single example from Bloemfontein.

It is possible, however, to distinguish this form from that of the type, owing to the greater length of the fang of the lower jaw. In the typical variety, the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{1}{2}$ – $1\frac{3}{4}$ times the distance between the apices of the two large teeth: in the Kimberley and Bloemfontein specimens, the proportion is greater, being $2-2\frac{1}{2} : 1$. This form I now designate *S. coquinae* var. nov. *orangicus*.

The species is smaller than *S. hostilis* or *derbiana*: the measurements of an adult female from Cookhouse are as follows: breadth of head-plate 6·75, length of tibia and tarsus of palp 6·7, of patella of palp 5·6, of tibia of fourth leg 5·6, of patella of fourth leg 6.

The colouration is very much like that of *hostilis*. In the typical male all the abdominal tergites are infuscated throughout, and the sides of the abdomen silvery, but in the Kimberley and Bloemfontein specimens, one or two of the anterior tergites are dark brown not black. The hind legs are more or less infuscated, rather than red as in *hostilis*. In the female, on each side of the anterior tergites, which are brown, there is a more or less distinct dark stripe passing backwards into the blackened area posteriorly, and along the midline also is a series of dark stripes but these are in the soft skin between the tergites: the hind legs are red.

Solpuga hostilis White [Pl. IV, figs. 16 and 17, and VI, fig. 29], 1846. Pocock in *Ann. Mag. Nat. Hist.* 6, xvi. p. 89, Pl. IV, fig. 7. Purcell in *Annals S. Af. Mus.* 1. p. 427, fig. 27 (*cultrata*).

The species cannot be recognised from the original description and figure given in Methuen's *Life in the wilderness*, and the locality of the type was simply stated as "S. Africa, near the tropic of Capricorn." Mr Pocock, having examined the types, has specifically identified therewith some specimens from Estcourt; and a species recorded from Durban and described by Dr Purcell under the name of *S. cultrata* is now regarded by Purcell and Kraepelin as *hostilis*. This species is common in the Transvaal and has been recorded by me from various localities in the Pretoria and Zoutpansberg districts. We have a series of both sexes from Doornkop near Belfast (R. Gerhardt). An example from Lüneburg, Natal (W. Oom) differs from any of the above in that the tip of the upper fang is scarcely up-turned, and the flagellum is not bent downwards near the apex.

In the male, stridulatory ridges are usually quite absent from the chelicerae: in a specimen from Gezina, Pretoria, three abbreviated ridges occur. The fang of the lower jaw is long, the distance from its tip to the apex of the first tooth being equal to about $2\frac{1}{2}$ times the distance between the apices of the two large teeth. The keel on the outer side of the lower jaw of the male is very strongly developed, being much more pronounced than in *marshalli*. It varies however to some extent, but usually in the basal portion of the jaw is raised into quite a high ridge.

In the female the anterior tergites are uniformly reddish brown, the blackening of the posterior part of the abdomen commencing rather suddenly: in Transvaal specimens black pigmentation only occurs on the last three tergites. In specimens from Lüneburg the sides of the anterior tergites are infuscated, but this blackening does not take the form of sharply defined blotches or stripes such as occurs in *chelicornis*. Males have the tergites more or less infuscated throughout, the mesial portions of the anterior tergites being dark brown and the sides black: hind legs red in both sexes, maned only in the male. The measurements of an adult female from Pretoria are: breadth of head-plate 9.1, length of tibia and tarsus of palp 8, of patella of palp 7, of tibia of fourth leg 6.5, of patella of fourth leg 7.3.

A very young specimen from Mfongosi, Zululand, has only 5 joints on the fourth tarsus of one side, but is normal on the other side.

Solpuga marshalli Pocock [Pl. VI, fig. 30], 1895. *Ann. Mag. Nat. Hist.* 6, xvi. p. 91, Pl. IV, figs. 9 and 9a.

The type came from "Fort Salisbury, Mashonaland." The species is not easily recognised from Pocock's figures, whilst Kraepelin's illustration in *Das Tierreich* seems to me referable to some other species, and perhaps may not be based on Mashonaland material. Kraepelin records the species from the Transvaal and from Durban but these records may be viewed with some suspicion in view of possible confusion with *hostilis*, and seeing that no specimens of *marshalli* are represented in the Transvaal and Durban Museums. Mr Hirst informs me that in the type specimen the end of the flagellum is very finely pointed, and the edges near the end very finely granular.

We have male and female specimens from Salisbury (Fr. J. O'Neil, and C. von Hirschberg). In the male, as in the female, stridulatory lamellae are present on the chelicerae but are not long. Towards the tip of the flagellum its dorsal edge is minutely serrulated. The fang of the lower jaw is not very

long in the male, the distance from the tip of the fang to the apex of the first tooth being about equal to $1\frac{3}{4}$ times the distance between the apices of the two large teeth.

The measurements of male and female specimens are as follows: breadth of head-plate, M, 7.5, F, 9; length of tibia and tarsus of palp, M, 8.5, F, 7.9; length of patella of palp, M, 8.35, F, 6.65; length of tibia of fourth leg, M, 7.8, F, 6.3; length of patella of fourth leg, M, 8.4, F, 7.1.

This species is more darkly coloured than *hostilis*. The tergites are strongly infuscated in both sexes, but the mesial portions of the anterior segments are dark brown rather than black. The soft skin at the sides of the abdomen is somewhat infuscated, though silvery white hairs occur there. The sternites are broadly infuscated at the sides in both sexes, but more specially in the male. Hind legs very dark brown.

Solpuga junodi Purcell, 1903. *Novitates Zoologicae*, vol. x. p. 304, fig. 2.

The type came from Shilowane, Zoutpansberg dist. and I have recorded it from Vygeboompoort in the Waterberg dist.

Solpuga tubicen Kraepelin [Pl. VII, fig. 35], 1911. *Mit. a. d. Nat. Mus. Hamburg*, xxviii. p. 102.

This is a Transvaal species, but no precise locality is known. There is a dense group of stout bristles on the upper surface of the chelicera, near to the basal enlargement, and to the end of the shaft. On the inner side of the upper fang there is a very strong outstanding keel, commencing at the anterior bend and extending forwards beyond the first tooth. No distinct mane on the hind legs. In the lower jaw, the distance from the tip of the fang to the apex of the first tooth is equal to about twice the distance between the apices of the two large teeth, or a trifle more than twice.

Solpuga hamata Hewitt, 1913. *Annals Transvaal Mus.* iv. p. 160, fig. 22.

The type came from Mamiaanshoek near Zwagershoek in the Waterberg dist., and other specimens were recorded from Vygeboompoort in the same district.

The fang of the lower jaw is very long, the distance from the tip to the apex of the first tooth being about three times the distance between the apices of the two large teeth, or even a little more.

Solpuga bechuanica Hewitt [Pl. IV, fig. 14], 1913. *Annals Transvaal Mus.* iv. p. 161, fig. 23.

The type came from Serowe in the Bechuanaland protectorate. Stridulatory ridges on the chelicerae are only weakly developed in the male. The large teeth of the lower jaw are widely separated, a distinct interval occurring between the distal tooth and the small intermediate tooth: the distance from the tip of the fang to the apex of the distal tooth is about $1\frac{3}{4}$ times the distance between the apices of the two large teeth.

As in *chelicornis* and *villosa*, this species has a row of four long spines on the outer side of tarsus II superiorly: in *hostilis* and *venator* distinct spines are wanting, being represented however by bristles several of which in *marshalli* are spiniform.

Solpuga chelicornis A. Licht. [Pl. III, fig. 11], 1796. Kraepelin, *Das Tierreich*, p. 59, fig. 17.

Of this species, several varieties markedly differing in colour may be recognised.

Mr S. C. Cronwright-Schreiner, in writing of the living animal as found at Hanover, described it as "of a most brilliant yellow, with a heavy black band down the back of the abdomen while the legs are covered with long yellow hair, which in the male, becomes a distinct mane and is iridescent. As it lies on the sand on a hot day, sparkling in the sunshine, it is a most exquisite creature¹."

This variety I now designate *S. chelicornis* var. *pubescens* [Pl. II, fig. 2]. Its most marked character is a dense pile of short pale hairs on the upper surfaces of the patella and tibia of the palp in the adult male, and to a less extent in the female. The sides of the head-plate and chelicerae are thickly, though rather shortly, bearded. The fringes of hair on the hind legs are particularly heavy, extending in attenuated form as far as the distal segments of the tarsi. The lateral black bands of the abdomen commence to merge on the fourth abdominal tergite, and fusion is quite complete on the fifth tergite. The terminal fang of the lower jaw is long, the distance from the tip of the fang to the apex of the first tooth being equal to about twice the distance between the apices of the two large teeth. In the single series of the upper jaw, the distance between the first and second teeth is about $1\frac{1}{2}$ times the distance between the second and fourth teeth. This variety is known to me from De Aar (S. C. Cronwright-Schreiner and Miss E. Friedlander), and presumably the Hanover specimens are referable thereto. We have female examples which seem to belong to the same variety from Dikop Flats near Grahamstown (Miss J. Harris), and from Zandkraal near Steytlerville (Miss A. Geard). Also, Dr Purcell's records from Namaqualand, Kenhardt, and Willowmore divisions are probably based on this variety.

According to Kraepelin's account in *Das Tierreich*, the typical form of the species is coloured quite differently, much as in the following form now named *S. chelicornis* var. *rufescens* [Pl. II, fig. 3]. This variety is known to me from Longhope (Miss E. Abrahamson), and Dirkskraal, Somerset East dist. (B. Marais). The upper surfaces of the patella and tibia of the palp are quite devoid of the pile of short hairs that occurs in *pubescens*. The sides of the head-plate and chelicerae are not bearded. All the hairs of the mane on the hind legs are white, at any rate in their distal portions, but the hairs situated on the broader part of the mane are magenta coloured in the basal half of each hair. The hairs on the sides of the abdomen are quite white. The surfaces generally are dull brown, more darkly so on the tibia and tarsus of the palp: the pale brown mesial area of the abdomen superiorly extends over the first seven tergites, being bordered on each side by a black stripe, and posteriorly by a black patch which covers the hind tergites.

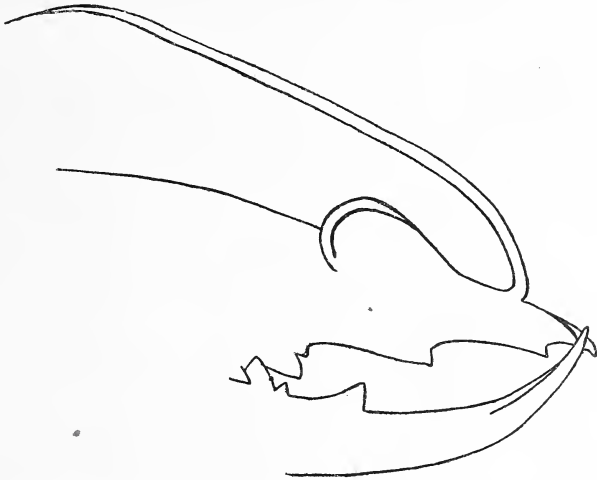
The jaw characters are similar to those of *pubescens*.

Another distinct variety occurs at Kakamas (Miss H. C. Olivier). It differs from the two just described principally in the spacing of the teeth of the single series of the upper jaw: the distance between the first and second teeth is less than the distance between the second and fourth teeth; in the lower jaw, the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{4}{5}$ times the distance between the apices of the two large teeth. The appendages are pale yellowish (in spirits): the posterior tergites are not so deeply blackened as in *pubescens*, yet the infuscation extends considerably forwards, the mesial pale brown area only reaching backwards over the first four abdominal tergites. The mane of the hind legs is not so strongly developed

¹ "Some Arachnids at Hanover, Cape Colony," by S. C. Cronwright-Schreiner, in the *Popular Science Monthly*, December, 1902.

as in either of the varieties just described, nor is there a conspicuous pile of short hairs on the upper surfaces of the patella and tibia of the palp, although numerous very short hairs occur there. This form I now designate *S. chelicornis* var. nov. *macrognathus* [Text fig. 9]. The colouration approaches that of the *hostilis* section, and the dentition is not very different from that of *S. bechuanica*.

Lastly, Kraepelin has recorded *chelicornis* on the evidence of a female specimen from Okawango in the north of S.W. Africa. It may also be noted that Kraepelin's figure in *Das Tierreich* seems to indicate a variety distinct from any of the above in respect to the dentition.



Text fig. 9. *Solpuga chelicornis macrognathus* var. nov. Left chelicera of male viewed from mesial side.

The measurements of the adult males of the three forms here distinguished are as follows:

	var. <i>rufescens</i>	var. <i>pubescens</i>	var. <i>macrognathus</i>
Breadth of head-plate	6.1	8	5.8
Length of patella of palp	8.2	10.8	8.3
Length of tibia and tarsus of palp	8.8	11.1	(absent)
Length of patella of fourth leg ...	8.3	11.1	8.5
Length of tibia of fourth leg	8.4	11.3	8.15

Solpuga villosa Purcell, 1899. *Annals S. Af. Mus.* I, p. 422, fig. 24.

The type male of this species was indefinitely located "S. Africa." Other specimens which seemed to be referable thereto were recorded from Concordia in Namaqualand, and from Fraserburg: these, however, were apparently female examples, and as such possibly indistinguishable from *chelicornis*. Subsequently, Dr Purcell regarded this species as essentially the same as *chelicornis*, and Prof. Kraepelin also held the two as conspecific, though distinct as varieties. To me, it seems well worthy of distinction from *chelicornis*. We have male specimens agreeing precisely with the description of *villosa*, from Victoria West (P. D. Morris), and from Tafelberg (Miss A. Gadd). Females from these localities are easily distinguishable from those taken along with the *pubescens* form of *chelicornis* in the colour pattern of the

abdomen: in *villosa*, there are only three pairs of black blotches on the abdomen anteriorly, these being followed immediately by the black patch which covers all the posterior tergites: in *chelicornis* var. *pubescens* there are six or seven pairs of black blotches in front of the continuous bands. In both species, the posterior abdominal sternites are infuscated throughout their breadth, instead of at the sides only, as in females of *hostilis* or *derbiana*: the blackening is more intense at the sides however. The hind borders of the genital plates are considerably produced in both species.

The terminal fang of the lower jaw is not quite so elongated as in the *pubescens* form of *chelicornis*, which this species resembles in the possession of a dense pile of short hairs on the upper surfaces of the distal segments of the palp in both sexes, but more especially in males: the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{4}{5}$ times the distance between the apices of the two large teeth.

Solpuga hastata Kraepelin, 1899. *Das Tierreich*, p. 58, figs. 15 and 16.

The type and only known specimen is indefinitely located Gt. Namaland.

Solpuga methueni Hewitt, 1913. *Annals Transvaal Mus.* vol. iv. p. 153, fig. 18.

The type came from Quibis, S.W.A., near the Karasbergen.

Solpuga ornithorhyncha Hewitt [Pl. V, fig. 19], 1913. *Annals Transvaal Mus.* vol. iv. p. 151, fig. 17.

The types came from localities near the Karasbergen, S.W.A., viz. Kraikluft, Narudas Süd, and from between Kraikluft and Sandmund. Stridulatory ridges are well developed on the chelicerae of the male. The lower jaw has numerous feathered bristles on its inner side, and on the outer side is a feeble but distinct ridge distally. The colouration of the abdomen has a general resemblance to that of *hostilis*, and the species is no doubt diurnal in habit. The tergites are entirely brown except for slight infuscation in the middle, which is faint in the anterior segments but more pronounced posteriorly, the three posterior tergites being dark brown throughout: the soft skin between the tergites is also blackened mesially. On each side of the tergites, the soft skin is blackened as a continuous longitudinal stripe. Below this, the sides are silvery. The sternites are infuscated laterally.

Solpuga lineata C. L. Koch [Pls. III, fig. 7, and VI, fig. 33], 1842. Kraepelin, *Das Tierreich*, p. 65, fig. 26. Purcell, *Annals S. Af. Mus.* 1. p. 428, fig. 28.

Dr Purcell records this species from the divisions of Namaqualand, Carnarvon, Uitenhage, Robertson and Swellendam. It is known to me from Alicedale (F. Cruden), Dunbrody (V. Powels), De Aar (Miss E. Friedlander) and Victoria West (B. Marais).

Stridulatory ridges are well developed on the chelicerae of the male. In the lower jaw of the male, the patch of bristles on the inner surface includes two or three curved spines distally, thus differing from *hostilis*, and most other species, where the patch is composed of bristles of more uniform size: the stouter curved bristles and spines are mostly in a single line along the lower portion of the extensive patch of bristles. There are numerous feather bristles which, however, like those of the upper jaw, are not very densely feathered. There is a very long interval between the first and second teeth of the lower jaw. On the outer side of the lower jaw is a distinct keel. In the female the posterior margins of the genital sternite are rounded.

Species incertae sedis.

Solpuga brevipalpis Purcell, 1899. *Annals S. Af. Mus.* I. p. 431, fig. 29.

The types are female specimens from Naroep in Gt Bushmanland. It is an ally of *S. lineata*.

Solpuga caffra Pocock, 1897. *Ann. Mag. Nat. Hist.* 6, xx. p. 262.

The types, two adult females, came from Estcourt. The colour characters are like those of *S. toppini* Hirst, from Ngxwala Hill, Zululand.

Solpuga nigrescens Pocock, 1895. *Ann. Mag. Nat. Hist.* 6, xvi. p. 88.

The type is a female example labelled "Lower Zambesi." Mr Pocock doubtfully identified therewith some specimens from the north-eastern region of Victoria Nyanza.

Solpuga schultzei Kraepelin, 1908. *Denks. d. med.-nat. Gesell. Jena*, XIII. p. 270, figs. 2 and 3.

This species is based on a female example collected at Rooibank near Walfish Bay. It is closely related to *picta*—which according to Kraepelin includes *nigrobaccata*—the two species being remarkable in the great elongation of the jaws, the first tooth of the upper jaw being considerably removed from the second as well as from the apex of the jaw. Apparently also, the tibia of the second leg has thickened hairs instead of spines on the dorsal side externally.

Solpuga striata Kraepelin, 1914. *Beit. z. Kennt. Land- u. Süßwasserfauna Deutsch-Südwestafrikas, Skorpiones u. Solifugae*, p. 124, fig. 1.

The type specimen, taken on farm Voigtsland about 38 km. east of Windhuk, is probably very immature, being only 11 mm. long (without mandibles). Kraepelin seemed to regard it as referable to the group of *S. lateralis* and allies, but I have no doubt that it really belongs to the group of species including *S. sericea* Poc., *S. zebrina* Poc. and *S. celeripes* Hirst, and quite possibly is identical with one of these. The colour pattern represented in Kraepelin's illustration is precisely similar to that exhibited by male and immature specimens of *celeripes*.

Solpuga picta Kraepelin, 1899. *Das Tierreich*, p. 81, figs. 59 and 60. Purcell, *Annals S. Af. Mus.* I. p. 431, fig. 30 (*S. nigrobaccata*).

The species is merely located as Damaraland.

Solpuga scopulata Karsch, 1880. Kraepelin, *Das Tierreich*, p. 60.

This species is only known from a female specimen taken at Hantam C.P.: it seems to be very like *chelicornis* Licht.

Key to the South African species of the genus Solpuga Licht. mainly based on the characters of adult males.

Group I.

Dentition of upper jaw almost alike in the two sexes, the distal series composed of four or five teeth in a continuous row, not broken by long toothless intervals, the first and second teeth being relatively large. The

terminal fang of the lower jaw not keeled on the outer side, or only weakly so, and not greatly elongated in the adult male, the distance from the tip of the fang to the apex of the first tooth being usually $1\frac{1}{2}$ times, or less, or at any rate not greater than $1\frac{3}{8}$ times the distance between the apices of the two large teeth: mesial surface of both upper and lower jaw usually with fairly strong development of feather bristles. In the male, the tibia of the palp is scopulate inferiorly over some portion of its length: upper margin of basal enlargement of flagellum blunt or sharp, but not greatly compressed into a thin high keel (except perhaps in *darlingi*): no keel on the mesial surface of the fang just in front of the anterior bend of the flagellum. Posterior median angles of the two halves of the first abdominal sternite in the adult female either rounded or rectangular, never produced into narrow lobes. Posterior legs usually with sparsely disposed long hairs (occasionally as in *sericea* with numerous very long ones), never forming a distinct mane in either sex. (Species mostly nocturnal in habit and plainly coloured, being uniformly yellow or brown: only occasionally striped with black, or with strongly contrasting colours on the abdomen.)

A. Flagellum slightly produced anteriorly, the anterior bend situated fairly far forwards, over the first or second tooth: shaft long and subcylindrical over the greater portion of its length and with a projecting tooth near to the apex, or distinctly bifurcated distally.

1. Flagellum very long, reaching backwards as far as the ocular tubercle or a little further, strongly sinuate not far from the apex and just proximal to its lateral tooth which is short and sharp: the shaft of the flagellum is low lying, being only just above the basal enlargement anteriorly.

S. lethalis typicus Koch.

2. Similar thereto, but shaft of flagellum straight, not sinuate, the shorter apical branch ending bluntly and its surface minutely serrulated.

S. lethalis rectus var. nov.

3. Flagellum reaching backwards beyond the middle of the mandible but terminating some distance in front of the eye tubercle, only lightly sinuate between the apex and the short sharp lateral tooth; the apex laterally compressed and dilated above into a knife-like edge: anteriorly, the recurrent portion almost touches the basal enlargement.

S. venosa Purcell.

4. Flagellum reaching backwards beyond the middle of the mandible but not reaching the head-plate, terminating in a short sharp subulate apex at the base of which a fine straight pallid bristle-like process springs from the upper edge and extends backwards beyond the apex: proximally the shaft lies close to the basal enlargement, which is well elevated: anterior bend of flagellum situated behind the level of the first tooth and nearly over the second. Lower jaw with two or three small intermediate teeth. Dorsal surfaces of body, head-plate, and appendages strongly infuscated throughout in both sexes.

S. fusca C. L. Koch.

5. Similar to *fusca*, but the spine-like process near the apex of the flagellum much shorter, not extending as far as the apex: anterior bend of flagellum situated almost immediately over the first tooth. Lower jaw with only one intermediate tooth. Dorsal surfaces somewhat infuscated.

S. toppini Hirst.

6. Flagellum not quite reaching the head-plate: towards the apex it presents a distinct bend and then bifurcates into two sickle-shaped processes, each finely pointed at the tip, the mesial and more slender process carrying microscopic setose teeth on its surface.
S. furcifera Kraep.

B. Recurrent portion of flagellum long, usually reaching as far as the ocular tubercle or beyond, but not toothed nor bifurcate at the apex, nor serrated along its upper edge (or only faintly serrated immediately anterior to the distal sinus in *venator*). The shaft is broadest at the anterior bend but is not strongly flattened there.

7. Flagellum strongly sinuate near to the apex, proximally lying close above the basal enlargement which is comparatively short and its upper edge arched: the anterior bend lies over the apex of the first tooth or a little anterior thereto. Only one small tooth between the second and third large ones of the upper jaw, or if two are present one of them is quite minute.
S. venator Poc.

8. Flagellum reaching back well beyond the ocular tubercle, straight throughout, or slightly sinuate towards the apex, the proximal portion situated well above the basal enlargement which is very long and low, the upper edge thereof being straight for quite a long distance. Usually two rather small teeth between the second and third large ones of the upper jaw, but the first of these may be quite minute or practically absent. A very strong development of long and straight stout spines on the outer and upper surfaces of the upper jaw.
S. monteiroi Poc.

C. Procurrent portion of flagellum short: shaft long and more or less cylindrical, at any rate over the first half of its length, sometimes a little flattened, finely serrated for some distance along the upper or lower edge distally or along a curved or spiral ridge (in *spiralicornis* the serrated edge may be very short or perhaps obsolete).

9. Terminal fang of upper jaw very short, with fairly strong blunt internal tooth dorsally against which the lower jaw closes: shaft of flagellum somewhat flattened, more especially at the anterior bend which is rather broad, reaching back a little beyond the middle of the mandible, lightly arched in the distal third and gradually tapering to a fine point. Anterior bend of flagellum over the first tooth, or the interval between the second and first teeth. A fairly strong development of long pointed spines on upper surface of chelicera.
S. schlechteri Purcell.

Terminal fang of upper jaw quite long, with a minute internal tooth.

10. Flagellum reaching to a point between the middle of the mandible and the ocular tubercle, bearing a more or less distinct denticulate crest in the posterior third or fourth of its length: there are usually two light curves in its course, a long one proximally and a short one distally (but these are sometimes obsolete), and between them is a shallow dorsal sinus situated in the distal third. Viewed from above, the distal portion of the flagellum beyond the sinus is practically in a line with the main axis, and the shaft is not abruptly narrowed at the sinus, but tapers gradually from this region to the apex. Anterior bend of flagellum situated over the second tooth. Basal

enlargement high, not much elongated, the anterior upper margin being rather lightly curved, but not forming an angle with the posterior ridge which is strongly curved.
S. serraticornis Purcell.

11. Similar thereto, but flagellum reaching as far as the ocular tubercle. A dense group of long strong spines on the upper and outer surfaces of the chelicerae.
S. serraticornis var. *umtalica* Hewitt.

12. Flagellum reaching just beyond the middle of the mandible, spirally twisted, and carrying a spiral serrated crest over the distal two-thirds of its length except near to the tip. Basal enlargement short, with curved upper margin. On the upper surface of the chelicerae there are a few long slender spines and stiff bristles but practically no stout spines.
S. strepsiceros Kraepelin.

13. Somewhat like *serraticornis*, but the denticulate crest on the flagellum feebly developed, being restricted to the inferior edge at the distal sinus. The flagellum is twisted as well as curved at the well-marked distal sinus: viewed from above, the portion beyond the sinus is quite straight, or nearly so, and parallel with the main portion of the shaft but distinctly external thereto: at the distal end of the sinus, the shaft becomes rather suddenly reduced in thickness, and thence to the apex is gradually drawn out to a fine point. Basal enlargement somewhat elongated, the upper margin being straight or nearly so for a considerable distance: shaft rather broad at the anterior bend, but otherwise not flattened. On the lateral and upper parts of the chelicerae there is a very strong development of straight stout spines.
S. spiralicornis Purcell.

D. Recurrent portion of flagellum very short, not or scarcely extending back beyond the basal enlargement, and not strongly flattened over the greater portion of its length: procurrent portion very short, the anterior bend situated over the second tooth, or the interval between the first and second: on the inner dorsal edge of the upper jaw, just in front of the anterior bend of the flagellum, there is a small or minute tooth.

14. Flagellum an upstanding process, shaped somewhat like the horn of a rhinoceros, broad and strongly flattened from front to back at the anterior bend, tapering gradually towards the apex which is truncate, the central core projecting out therefrom a little: tip of flagellum situated just above the middle point of the basal enlargement.
S. schönlandi Pocock.

15. Flagellum somewhat similar, but at the apex is an enlarged globose swelling, the cuticle of which is minutely pubescent, thin, and pale, thus markedly contrasting with the shaft: the shaft is continued on the inner side of the swelling into a sharp-pointed flanking spine: the shaft is short and stout, being very broad at the anterior bend where it is flattened from front to back. Long spines and stout bristles are fairly well developed on the upper surface of chelicerae.
S. globicornis Kraep.

E. Flagellum not, or only slightly, produced anteriorly, the anterior bend overlying the second tooth; recurrent portion short, strongly flattened over the greater portion of its length: upper jaw on its inner dorsal edge, near to the anterior bend of the flagellum, furnished with a fairly conspicuous tooth, or two small teeth, against which the lower fang closes.

16. Shaft of flagellum extending backwards about as far as the basal enlargement: at the anterior bend it presents the appearance of a broad stiff membrane: this quickly becomes much broader, but at the same time is strongly folded longitudinally along the middle, so that a transverse section of the flagellum at about the middle point of its length would be V-shaped, the angle being directed upwards and forming the upper margin of the flagellum in side view. In the apical third, the membrane tapers gradually, the apex being not very sharp, and at a short distance therefrom on the inner side is a strong accessory tooth. The single dorsal tooth on the inner side of the fang projects forwards and is long and strong. *S. ferox* Pocock.

17. Shaft of flagellum reaching back to a point which is a little further from the hind margin of the basal enlargement than this from the anterior bend. Tip of flagellum pointed and barbed somewhat like an arrowhead: the terminal portion is also armed at the base with two strong serrate teeth, one external and the other inferior. *S. sagittaria* Pocock.

18. Tip of flagellum nearer to the posterior margin of the basal enlargement than is that margin to the anterior bend. Apex blunt. At the anterior bend, the shaft is very broad, becoming strongly twisted as it passes backwards: not far from the apex, its upper edge presents a small sharp tooth. On the inner dorsal edge of the fang of the upper jaw, there are two small tubercles near to the anterior bend of the flagellum. *S. suffusca* Hewitt.

F. Like D, but flagellum a little longer and the anterior bend situated further back over the intermediate small teeth.

19. Recurrent portion of flagellum reaching back a little beyond the posterior border of the basal enlargement, and becoming gradually attenuated at the tip: basal enlargement with a high crest and upright posterior border. *S. darlingi* Poc.

20. Recurrent portion a little longer than in *darlingi*, running backwards and upwards at an angle of 45° , straight throughout the greater portion of its length but distinctly sinuate in the distal fourth, the apex being directed upwards: basal lamina not so elevated, its outline about semicircular. Head-plate, mandibles and abdomen with black stripes. *S. sericea* Poc.

21. Flagellum still longer, gradually tapering to a slender apex, which is situated about midway between the anterior bend and the ocular tubercle; shaft doubly sinuate from side to side and strongly curved in a vertical plane in its distal half, the apex being directed downwards. Basal enlargement high and almost circular in outline. *S. alstoni* Purcell.

22. Shaft of flagellum strongly flattened over the first portion of its length, then becoming abruptly narrowed distally so that the apical third or fourth is setiform: total length of recurrent portion equal to about twice the distance between the anterior bend and the hind margin of the basal enlargement, which is rounded in outline. First tooth of lower jaw situated midway between the second tooth and the tip of the fang: lower jaw with feathered bristles on its inner surface. Upper jaw with no distinct tooth on the superior inner margin near the base of the fang. Dorsal surfaces with blackish stripes. *S. celeripes* Hirst.

G. Shaft of flagellum short, directed forwards and extending about as far as the tip of the fang or even a little anterior thereto,

then curving upwards a little but not or only slightly recurved, broad and strongly flattened throughout, distally with several short lobes or processes. In the upper jaw, the single series includes two anterior strong teeth, followed by a short interval, and then two or three teeth.

23. Flagellum terminating in a short sharp strongly curved spur, directed outwards and upwards, and composed of two closely appressed pieces: on the outer edge of the shaft, near to the apex, is an obtuse lobe-like process, and on the inner edge, still nearer to the apex, is a curved filiform process minutely serrulated along its outer edge. *S. cervina* Purcell.

24. Similar thereto, but flagellum terminating in a broadly ovate lobe, with rounded apex, and provided with a straight acute process extending outwards from the posterior upper part: the upper edges of the lobe and its process are continuously serrated. *S. collinita* Purcell.

25. Shaft of flagellum broadening out distally and dividing into three divergent backwardly directed slender processes, the middle one of which is shortest and stoutest, being straight, indurated and sharply pointed at the tip, the other two being curved and comparatively weak, the shorter mesial one being finely serrulate above near its apex. *S. alaicornis* Kraepelin.

Group II.

Dentition of the upper jaw very dissimilar in the two sexes; in the female continuous, and closely resembling that of Group I; but in the adult male with a long toothless space in the middle of the single series (except in *Jumodi*), thus separating the teeth into two groups of two teeth each, the teeth of the distal group varying much in size and occasionally with an additional small tooth anteriorly. Adult female with the first abdominal sternite more or less produced at the hind angles mesially into a pair of narrowed lobes (cp. Pl. III, fig. 11).

The species are all diurnal, and at once distinguished from the nocturnal species of group I by the strongly contrasting colours of the abdomen, the sides of which are white or yellow, whilst the posterior tergites are black or strongly infuscated, the anterior tergites being paler mesially but usually becoming infuscated laterally, thus presenting a dark lateral band on each side which gradually merges with the blackened area of the posterior tergites. The upper margin of the basal enlargement of the flagellum of the male is elevated into a sharp keel: the lower jaw usually has a very long fang, and on the outer side distally is a sharp keel, which is sometimes continued as a prominent granular crest towards the base of the jaw: feather bristles are poorly developed on the inner surface of the lower jaw, and are not very well developed on the upper jaw. Posterior legs usually with numerous long hairs which are sometimes arranged in a distinct mane in adult males.

A. Terminal fang of upper jaw without a long keel on its mesial side, but provided with a dorsal forwardly projecting tooth just in front of the anterior bend of the flagellum, or with an abbreviated

keel. Flagellum strongly flattened from front to back at the anterior bend, being as wide as the fang itself at this point, or nearly so. Shaft of flagellum filiform throughout.

26. Flagellum reaching back a little beyond the ocular tubercle and slightly blunted at the tip: the anterior bend situated far forwards, overlying the most distal tooth: basal enlargement very high, the whole upper margin elevated as a high laminar keel. On the inner side of the upper jaw, near to the anterior bend, is a distinct dorsal tooth pointing forwards. Two distal teeth of upper jaw moderately large, and in front of these is a more or less distinct though minute additional tooth. *S. lateralis* Koch.

27. Anterior bend of flagellum overlying the tooth preceding the long interval, the shaft terminating a little posterior to the hind margin of the basal enlargement. Three distal teeth in the upper jaw, the second and third being of moderate size. *S. erythronotoides* sp. nov.

28. Anterior bend more posteriorly situated, overlying the toothless interval: shaft reaching back about half way along the mandible. Basal enlargement high. Two distal teeth of upper jaw moderately well developed. *S. erythronota* Kraepelin.

B. Shaft of flagellum not simply filiform, but more or less flattened and expanded in the distal portion, where the edges are frayed out into processes or deeply serrated.

29. Terminal fang of upper jaw with a dorsal tooth but no keel or only a very weak one on its mesial side. Flagellum broad at the anterior bend, which overlies the tooth preceding the long interval, reaching back about as far as the ocular tubercle, and filiform over the greater portion of its length, but in the terminal third it expands slightly into a lamina and divides into two main portions, the longer one being drawn out to a filament with serrated margins, the shorter one ending abruptly but bearing a short and slender serrated extension running parallel to the longer process just mentioned. Two distal teeth of upper jaw moderately large. *S. maraisi* Hewitt.

30. Anterior bend of flagellum overlying the toothless interval, the shaft reaching back beyond the middle of the mandible, being deeply and finely serrated along its upper edge in the distal half which is much flattened from the sides. Fang of upper jaw with an exceptionally high keel arising from the upper surface along its inner edge, just above the distal group of teeth and in front of the flagellum. *S. spectralis* Purcell.

31. Anterior bend situated as in *spectralis*, the shaft short, about as long as the terminal fang of the lower jaw, and serrated along three edges in its distal half which is expanded except towards the apex. A thin upright blade-like keel, serrated anteriorly, and provided with a sharp forwardly directed tooth about the middle of its length, occurs on the inner side of the fang of the upper jaw. *S. vincta* Koch.

C. Terminal fang of upper jaw grooved on its mesial side superiorly for the reception of the procurrent portion of the shaft of the flagellum, the groove continued in front of the anterior bend, being bounded mesially by a long keel which extends from the anterior bend towards the tip of the fang. Flagellum not broad at the anterior bend, the shaft filiform, not expanded.

a. Anterior bend of flagellum posteriorly situated, overlying some portion of the toothless interval.

32. The distance from the tip of the flagellum to the hind margin of the basal enlargement is less than the length of the basal enlargement, which is much longer than high. Two distal teeth of upper jaw weak. In the lower jaw, the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{1}{2}$ – $1\frac{2}{3}$ times the distance between the apices of the two large teeth.

S. coquinae typicus Hewitt.

33. Similar thereto, but fang of lower jaw longer, the distance from the tip of the fang to the apex of the first tooth being equal to about 2 – $2\frac{1}{3}$ times the distance between the apices of the two large teeth.

S. coquinae orangicus var. nov.

34. Flagellum short, reaching back only a little beyond the hind border of the basal enlargement, and suddenly expanded at its apex into a slender funnel with obliquely truncated margins. Two distal teeth of upper jaw of moderate size, the keel on the inner side of the fang strong and outstanding.

S. tubicen Kraep.

b. Anterior bend of flagellum more anteriorly situated, overlying the tooth preceding the long interval, or a trifle anterior thereto.

35. Flagellum reaching back nearly to the end of the mandible: basal enlargement much longer than high: two distal teeth of upper jaw weak.

S. derbiana Pocock.

36. Recurrent portion of flagellum short, ending in a fine point just posterior to the basal enlargement which has a high dorsal keel. The toothless interval of the upper jaw is practically obsolete as such, the two distal teeth being large, strongly compressed and sublunate. The teeth of the lower jaw are close together near the base, the fang being very long.

S. jumodi Purcell.

c. Anterior bend of flagellum still more anteriorly situated, overlying either the most distal tooth or even in front thereof.

37. Flagellum slender, reaching to the ocular tubercle, sharp-edged near the apex. Two distal teeth of upper jaw usually weak, but the second may be of moderate size. Viewed from the side, the terminal fang of the upper jaw is directed obliquely upwards to a slight extent, being at an obtuse angle with the main axis of the jaw.

S. hostilis White.

38. Flagellum terminating in a slightly upcurled point above the ocular tubercle, the apex being very finely pointed but not cultrate. The shaft is distinctly flattened over a considerable portion of its length. Viewed from the side, the short terminal fang of the upper jaw is directed horizontally forwards in a line with the rest of the jaw, which is itself greatly produced in the region of the extended toothless interval. Two distal teeth of upper jaw of moderate size.

S. marshalli Pocock.

39. Flagellum not reaching so far as the hind margin of the chelicera, its apex presenting a sharp cutting edge for a short distance dorsally. Toothless interval comparatively short, the distance from the apex of the second tooth to the tip of the fang, being subequal to the distance between the apices of the second and fourth teeth.

S. tookei sp. nov.

40. Flagellum reaching to a point slightly posterior to the ocular tubercle, the distal fifth being bent strongly downwards, the apex minutely forked, and the indurated outer upper edge of the bent portion is notched at a short

distance from the apex. Two distal teeth of upper jaw large, the apex of the second tooth being just a trifle nearer to the apex of the fourth than to the tip of the fang, or midway between the two. *S. bechuanica* Hewitt.

41. Flagellum reaching to the ocular tubercle, lightly sinuate in its distal fifth, flattened from above near the apex and notched on the inner edge. First tooth of upper jaw rudimentary, separated by an interval from the second, which is large and posteriorly situated, so much so that the distance from the apex of this tooth to the tip of the fang is much greater than the distance between the apices of the second and fourth teeth. *S. hamata* Hewitt.

Group III.

Related to II C, but upper jaw with two rather long toothless spaces in the single series of teeth. A very well developed mane present on the hind legs. Tarsus II with a row of four distinct spines on the outer side superiorly.

42. Flagellum with the anterior bend about in a line with the mid-point of the first toothless space, the recurrent portion more or less straight throughout, about reaching to the hind edge of the chelicera, the posterior margin of the basal enlargement being decidedly anterior to the mid-point of the length of the flagellum. *S. chelicornis* Licht.

a. A dense pile of short pale hairs on the upper surfaces of the patella and tibia of the palp in the male. In the upper jaw, the distance between the first and second teeth is decidedly greater than the distance between the second and fourth. *S. chelicornis pubescens* var. nov.

b. Similar thereto, but without a pile of short pale hairs on the upper surfaces of the palp. *S. chelicornis rufescens* var. nov.

c. In the upper jaw, the distance between the first and second teeth is less than the distance between the second and fourth. *S. chelicornis macrognathus* var. nov.

43. Flagellum reaching back to a point about midway between the ocular tubercle and the hind margin of the basal enlargement, which is about in a vertical line with the mid-point of the flagellum; the anterior bend is rather more posteriorly situated, and above it the shaft makes a bold high curve (not depressed as in *chelicornis*). *S. villosa* Purcell.

Group IV.

The single series of teeth in the upper jaw presents no long toothless intervals, and comprises six teeth (or only five when the normally minute fourth tooth is obsolete or lacking), of which only the one basally situated is of large size, the first tooth being small, the third also small, and the second still smaller. In the lower jaw, the apex of the first tooth is nearer to the tip of the fang than to the apex of the basal large tooth. Anterior bend of flagellum far forwards, in front of the first tooth, the procurant portion of the shaft not sunk into a groove of the upper jaw, so that there is no keel nor tooth on the mesial surface of the terminal fang. Tibia of

palp well scopulate inferiorly, the whole palp being subequal to or only very slightly shorter than leg III. Females also have six teeth in the single series of the upper jaw, the first, third and sixth being of large size.

44. Flagellum reaching back almost to the ocular tubercle, in its distal fourth flattened dorso-ventrally and ending in a flat lance-like apex.

S. hastata Kraepelin.

45. Similar thereto, but the terminal fourth of the flagellum is deeply grooved above and for a short distance keeled below.

S. ornithorhyncha Hewitt.

46. Flagellum much shorter, presenting a large bold curve at the anterior bend, and directed obliquely upwards in a sinuous line with two curves in its course, a short deeper one near the apex, and a longer shallower one proximally: it reaches backwards only a little beyond the hind margin of the basal lamina, which is remarkable in being produced upwards as a short outstanding process.

S. methueni Hewitt.

Group V.

Dentition of upper jaw similar in the two sexes, the single series comprising a distal tooth at some distance from the tip of the fang, followed by 1-3 small teeth and one large one, then 3-5 small teeth, and finally another large one. Terminal fang of upper jaw with a fairly long high ridge on its mesial side, starting near the anterior bend of the flagellum and proceeding towards the tip of the fang. Terminal fang of lower jaw short, the distance from the tip thereof to the apex of the first tooth being only about $1\frac{1}{4}$ times as long as the distance between the apices of the two teeth. Tibia of palp not scopulate below, the whole palp being decidedly shorter than leg III.

47. Flagellum reaching back a little behind the middle of the mandible, flattened out in its distal half which is slightly twisted and fringed along the edges: anterior bend about on a level with the second tooth. Upper surfaces with black stripes.

S. lineata Koch.

Genus *Zeriassa* Pocock.

Zeriassa cuneicornis Purcell, 1899. *Annals S. Af. Mus.* i. p. 413, figs. 20 and 20 a.

The type, described under the name of *Solpuga cuneicornis*, came from Southern Rhodesia.

Zeriassa purcelli Hewitt [Pl. VII, fig. 36], 1914. *Annals Transvaal Mus.* iv. p. 163, fig. 25.

This species is only known from Newington, N.E. Transvaal.

The female referred to in the original description does not belong to the species. A small example from Newington, with the two long preocular spines characteristic of the genus, is no doubt the true female of this species. In this specimen, the terminal fang of the upper jaw is comparatively long, the first tooth is small, the second tooth is very long and large, being the longest in the whole dental series, the third is small, fourth of moderate size, and the fifth large: this may be regarded as completing the single series, although the outer

row of the double series is quite continuous with the single series. The outer row includes four teeth of which the distal one is the largest, but is not so large as the adjoining fifth tooth of the single series. The inner row includes three teeth, of which the first is largest and is widely separated from the second as well as from the single series: the basal tooth is quite small. In the lower jaw there is only one intermediate tooth. Both upper and lower jaw are strongly compressed from side to side: the lateral distal keel on the outer side of the lower jaw thus becomes carried ventralwards, and is not continued into the granular crest which runs along the middle of the basal portion of the jaw. The lower jaw has great depth, and thus in side view has a massive appearance. Stridulatory ridges are well developed on the chelicerae, numbering about 12 in the male, and 9-10 in the female. Feather bristles are not well developed on the lower jaw of the male: it resembles that of the female but is not so strong. The flagellum of the male has various points in common with that of *cuneicornis*, and it may be noted that the upper margin of the basal enlargement is elongated in both, and that the upper and posterior margins are acutely inclined to each other, with a large high keel at the angle. The procurvent portion of the shaft lies on the upper surface of the jaw, and is not sunk into a groove: on the mesial side of the fang superiorly, just in front of the anterior bend, an ill defined ridge occurs.

Key to the S. African species of Zeriassa.

1. Shaft of flagellum short, very broad at the anterior bend, being there almost twice the width of the fang below it, thence gradually narrowing towards the middle where a slight twist occurs and the shaft bends outwards slightly, ending in a point (apparently) a short distance beyond the basal enlargement. Basal enlargement with triangular outline when viewed from the side. Dentition of single series of upper jaw continuous, including five teeth: lower jaw with one intermediate tooth.

Z. cuneicornis Purcell.

2. Shaft of flagellum very broad throughout its length, tapering somewhat up to the distal twist but expanded a little near the apex, which carries a short slender hook-like process: it extends only a trifle beyond the basal enlargement. Upper jaw with six teeth in the single series: lower jaw with two intermediate teeth, and the distance from the tip of the fang to the apex of the first tooth is subequal to the distance between the apices of the two large teeth.

Z. purcelli Hewitt.

Genus Daesia Karsch.

Daesia subulata Purcell, 1899. *Annals S. Af. Mus.* 1. p. 393, fig. 12.

The type male came from Van Wijk's Vlei, Carnarvon.

Daesia bernhardi Pocock, 1900. *Annals Mag. Nat. Hist.* 7, VI. p. 317.

The type is a female from Hex River Valley. The character of spines and ridges on the sides of the abdomen inferiorly, considered by Pocock to be distinctive of this species, occurs also in *leipoldti*, *lineata*, and probably also in other species. I may remark that these structures are easily overlooked, for the sides of the abdomen are densely hairy and the spines and ridges quite small. To see them it is necessary to stretch out the integument and examine

under the low power of a compound microscope. The ridges mentioned by Pocock (7) occur in the soft skin of the sides inferiorly, immediately lateral to the interval between sternites III and IV. The spines on the soft skin of various segments, as specified by Purcell (12) who described them as "claw-like," are all quite slender.

Daesia namaqua Kraepelin, 1899. *Das Tierreich*, p. 94, fig. 63.

The type came from Gt Namaqualand, and Kraepelin records it also from Steinkopf in Little Namaqualand.

Daesia betschuanica Kraepelin, 1908. *Denk. med. nat. Gesell. Jena*, XIII. p. 273.

The type male came from Lobatsi.

Daesia kolbei Purcell, 1899. *Annals S. Af. Mus.* I. p. 391, fig. 10.

This is founded on a female specimen from Bulawayo.

Daesia pallida Purcell, 1899. *Annals S. Af. Mus.* I. p. 382, fig. 11.

The type is a female specimen from the Kenhárt div. C.P.

Daesia leipoldti Purcell, 1899. *Annals S. Af. Mus.* I. p. 388, fig. 9.

This species is based on female specimens from the Clanwilliam div. C.P.

Daesia hottentotta Kraepelin, 1899. *Das Tierreich*, p. 95, fig. 64.

According to Kraepelin, this is the commonest species of South West Africa, and he records it from various localities in Damaraland and Gt Namaqualand.

An example from Mt Temple, Bechuanaland (T. C. Lanham) is perhaps referable to this species. It has a flagellum like that of *lineata*, and along the middle is a dark midrib. The dentition of the upper jaw is not very different from that of *lineata*: the single series includes four teeth, of which the first and third are of moderate size, being not much smaller than the second and fourth, and the inferior outline of the fang is curved, not straight. The same form occurs at Upington (Miss Lennox).

Daesia lineata Pocock [Pls. VI, figs. 27, 28 and 31, and VIII, fig. 43], 1902. *Ann. Mag. Nat. Hist.* 7, x. p. 7, Pl. II, figs. 3, 3 a and 3 b. = *D. schreineri* Purcell, 1903, *Annals S. Af. Mus.* III. p. 14, Pl. I, fig. 11.

The type of this species was regarded as representing a distinct genus, and was described by Pocock under the name of *Broomiella lineata*. I am satisfied that Pocock's specimen was an aberrant example of the same species as was described subsequently by Purcell as *D. schreineri*. The most noteworthy feature of Pocock's specimen, according to the figure, is the small size of the fourth tarsus, which apparently is shorter than the third, and even the claw of the fourth is represented as shorter than that of the third tarsus. Now, in the genus *Daesia*, the claw of the fourth leg is normally much longer than that of the third, and so also is the tarsus as a whole, but occasionally exceptions are found. The exceptions observed by me are without doubt referable to the species *D. schreineri*, agreeing with normal examples of that species in the dentition and in the flagellum, and indeed are only remarkable in the characters of the fourth leg. In an adult male from Hopetown tarsus IV of the right side is normal, but the left tarsus IV is two-jointed, the whole leg being shorter than that of the right side, although its basal segments bear five malleoli: the tarsal claws of the shorter leg are noticeably short, being shorter than those of tarsus III, and the tarsus as a whole is only a little longer than

tarsus III. Again, a small female example from De Aar, where typical examples of *schweineri* occur, has the left fourth leg normal throughout, but the right leg is short and its tarsus two-jointed with quite short claws: there are five malleoli as usual. The peculiarities of these aberrant specimens are perhaps the result of injury during earlier stages in the life of the individual.

It should be noted that Pocock's figure of the flagellum does not represent that organ so correctly as the figure accompanying the description of *schweineri*, assuming the identity of the two species.

The type of *lineata* came from Pearston: that of *schweineri* from Hanover. We have the species from De Aar (S. C. Cronwright-Schreiner and Miss E. Friedlander), Tafelberg (Miss A. Gadd), Longhope (Miss E. Abrahamson), Zandkraal near Steytlerville (Miss A. Geard), Hopetown (Miss Stegmann), Smithfield (Dr R. Broom), and female specimens apparently referable thereto from Klerksdale near Middelburg (B. Marais).

The stridulatory ridges of the chelicerae are decidedly longer than in *Solpuga*, but are only 4-6 in number: the bristles on the mesial surface are much as in *Solpuga* and the feather bristles towards the distal end of the series are not enlarged. The lower jaw has feathered bristles on its mesial surface: the distance from the tip of the fang to the apex of the first tooth is about equal to $1\frac{1}{2}$ times the distance between the apices of the two large teeth: the intermediate tooth may be present or absent in male specimens from the same locality. In side view, the lower margin of the terminal fang of the upper jaw is quite straight: this seems to be a very constant character.

Rotated forwards, the flagellum either just reaches the tip of the fang, or slightly surpasses, or scarcely reaches the tip: during life this probably can be rotated through an angle of 180° , or slightly more, but not very much more.

The tarsus of the palp is slightly movable in both sexes: this is not the case in *Blossia*.

Daesia rhodesiana Hewitt, 1913. *Annals Transvaal Mus.* iv. p. 165, fig. 26.

The type male came from Lundi River, S.E. Rhodesia.

Daesia schultzei Kraepelin, 1908. *Denk. med. nat. Gesell. Jena*, XIII. p. 274, figs. 5 and 6.

The type is an adult male from the Kalahari.

Key to the S. African species of Daesia Karsch.

1. Upper jaw with a very long slender toothless terminal fang. Teeth of single series absent. Flagellum drawn out behind into a straight subulate shaft which exceeds the basal disc in length.

D. subulata Purcell.

2. Terminal fang of upper jaw rather long, followed by the single series of four teeth—two fairly large ones in front, then a small one, and then a large tooth. Flagellum drawn out into a shaft which is longer than the disc.

D. namaqua Kraepelin.

3. Terminal fang of upper jaw of moderate length or short, the single series of teeth continuous; the flagellum more or less elongated and pear-shaped, without a long shaft, though drawn out a little distally.

a. The single series of teeth in the upper jaw comprises two large ones in front, one small intermediate tooth, followed by a large tooth.

D. hottentotta Kraepelin.

b. Dentition similar to that of *hottentotta* but two small intermediate teeth in the single series.

D. pearsoni Hewitt.

c. The single series of teeth in the upper jaw comprising one small one in front, then a large one, then a small intermediate tooth, and finally a large one.

D. lineata Pocock.

4. Terminal fang of moderate length. Flagellum attenuated distally but not produced into a long shaft. Basal tooth of lower jaw with a broad more or less truncated apex. In the upper jaw, the longest and largest tooth is separated from the distal tooth by a deep bay:

a. This bay including one small tooth.

D. betschanica Kraepelin.

b. The bay being quite toothless.

D. rhodesiana Hewitt.

5. Terminal fang of upper jaw specially long, followed by a single series comprising only two teeth, both of which however are large. Flagellum continued beyond the capsule into a short dorsal process and a longer ventral one, connected together by a fold of membrane, the latter process being less than half the length of the capsule.

D. schultzei Kraepelin.

Genus *Blossia* Simon.

Blossia setifera Pocock, 1900. *Ann. Mag. Nat. Hist.* 7, v. p. 301, fig. 6.

The type male came from Salisbury, Mashonaland.

Blossia namaquensis Purcell, 1901. *Annals S. Af. Mus.* II. p. 211, fig. 2.

The type male came from Steinkopf, Namaqualand, C.P.

Blossia unguicornis Purcell [Pls. VII, figs. 39 and 40, and VIII, figs. 44 and 46], 1901. *Annals S. Af. Mus.* II. p. 213, fig. 3.

Types from Dunbrody, Uitenhage div., and the species is also known to me from Alicedale (F. Cruden), Somerset East (E. Driver), and Linedrift, Peddie (B. Marais).

In the male the head-plate is beset with short spinules, but each eye is protected on its mesial side by a curved row of upstanding spines: the chelicerae have numerous, rather short, sharp pointed, stout spines and a few long ones superiorly, and the thoracic tergites are also fringed with pointed spines: abdominal tergites with very short spines and weak spinules, the posterior one or two tergites with slender setae which are slightly notched at the tips: a few spines occur on the upper surfaces of the trochanters and femora of legs II-IV.

In the females of *unguicornis*, and probably of other species also, the head-plate is armed with short spinules or prickles, and the tergites and chelicerae with spines: these spines are not so strong nor so numerous as those of the male, the first tergite for example having a single row of long slender spines in the female, but far more numerous, shorter and much stouter spines, constituting more than one row, in the adult male.

Female characters are by no means constant throughout the genus *Blossia*. In a female from N.W. Gordonia, the tergites and chelicerae are armed with long and rather stiff setae, but not with spines, and the head-plate is devoid of spinules: moreover, the jaws are more slender and longer than in females of *unguicornis*.

In this genus, modified fleshy hairs on the sternites are not confined to the adult males, nor to the second sternite, although most strongly developed on that sternite in males. In adult females of *B. unguicornis* there occurs a mesial papilla on both fourth and fifth sternites: this papilla is split down the middle, and carries on each side a long pinkish thickened hair like those on the second sternite of males, but not nearly so stout. They also occur on the same sternites in the adult male.

Similar modified hairs occur in a female *Blossia* (cp. *setifera* Poc.) from Salisbury, being found on all three sternites II, IV and V: on II there are three or four modified hairs on each side, but in IV and V only two hairs occur on each side of the midline: they are situated rather further apart than in *unguicornis*.

These modified hairs are probably homologous with the stigmatic combs of the Galeodidae: the combs of *Galeodes* occur on the second and third sternites, and modified setae in a corresponding position are found also on the fifth sternite.

Blossia crepidulifera Purcell, 1901. *Annals S. Af. Mus.* II. p. 215, fig. 4.

The type came from Robertson C.P., and Dr Purcell cited also several records in the Worcester div.

Blossia karrooica Purcell, 1901. *Annals S. Af. Mus.* II. p. 217, fig. 5.

The types were taken at Prince Albert C.P.

Blossia litoralis Purcell, 1903. *Annals S. Af. Mus.* III. p. 4, fig. 3.

Types from the western shore of the Cape Peninsula.

Blossia lamnicornis Hewitt, 1919. *Annals Transvaal Mus.* VI. p. 65.

The type was taken at De Aar, C.P.

The point of origin of the flagellum is a little posterior and dorsal to the distal end of the row of feather bristles.

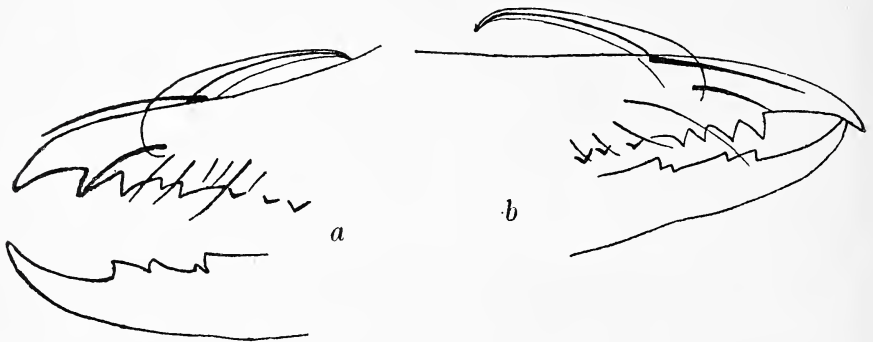
Blossia falcifera Kraepelin [Text fig. 10 a], 1908. *Jena. Denkschr.* XIII. p. 277, fig. 8.

This species is known from the neighbourhood of Windhuk: other localities cited are Neudamm and Tsumab. I have previously recorded the species from Quibis in Gt Namaland, and it is known to me also from Douglas C.P. (Dr R. Broom). These southern specimens do not agree absolutely with Kraepelin's figure of the type, but the flagellum is very similar throughout, and I think it advisable to regard such differences as occur in the dentition as of varietal value only. The lower jaw of the type, which is figured with five teeth, instead of four as occur in the specimens examined by me, is perhaps abnormal, for, according to the description, the type specimen presents considerable differences in this respect in the jaws of the two sides. In the upper jaw of the type, the terminal fang is fairly large; the distance from the tip to that of the first tooth being however distinctly less than the distance between the apices of the first and fourth teeth. The example from Quibis

is not very different, but the terminal fang is a trifle shorter, the distance from its tip to that of the first tooth being considerably less than the distance between the first and fourth teeth.

The male from Douglas is markedly different from the above, the terminal fang of the upper jaw being longer and more slender: the distance between the tip of the fang and the apex of the first tooth is equal to, or very slightly greater than, the distance between the apices of the first and fourth teeth. This variety may be termed var. *dolichognathus* (Text fig. 10 b).

The distal dorsal bristle in all these specimens reaches to a point about midway between the first tooth and the tip of the fang, or a trifle nearer to the first tooth: its surface is minutely prickled almost up to the pointed apex, which tapers gradually. On the outer side of the upper jaw there is an oblique row of simple bristles, the bases of which are in a line more or less parallel with the dental series. These bristles vary much in length and size, some being quite short, others long: the most distal one, arising from a point opposite to the base of the lamina, is markedly stouter than the rest, and its surface is minutely prickled. In the allied species *B. filicornis* mihi, this row of bristles



Text fig. 10, a and b. *Blossia falcifera* Kraepelin. (a) Upper jaw of male from Quibis, viewed from outer side. (b) Ditto of var. *dolichognathus* from Douglas.

is much more uniform, the distal one being scarcely stouter than the second, and the first three have prickled surfaces. In both species, the slender apex of the flagellum is upcurled.

Blossia fimbriata Kraepelin, 1914. *Beit. z. Kenntnis d. Land- u. Süswasserfauna Deutsch-Südwestafrikas*, p. 128, fig. 3.

The locality of the type is simply "Deutsch-Südwestafrika." It seems to be very distinct from any other species known from S. Africa.

Blossia echinata Purcell, 1903. *Annals S. Af. Mus.* III, p. 16, Pl. I, fig. 10.

The types came from Hanover C.P.

Blossia maraisi Hewitt, 1915. *Records Albany Mus.* III, p. 70, fig. 1.

The type male came from Peddie.

Blossia tricolor Hewitt, 1913. *Annals Transvaal Mus.* IV, p. 156, fig. 20.

The types were collected at Quibis in Gt Namaland.

Blossia clunigera Kraepelin, 1908. *Jena. Denkschr.* XIII. p. 275, fig. 7.

The type was taken at Steinkopf in Little Namaqualand.

Blossia obscura Kraepelin, 1908. *Jena. Denkschr.* XIII. p. 278.

This is based on a female from Khakea in the Kalahari.

Blossia filicornis Hewitt, 1913. *Annals Transvaal Mus.* IV. p. 158, figs. 21 and 22.

The types were taken at Alt Wasserfall in Gt Namaland.

Blossia laticosta Hewitt, 1919. *Annals Transvaal Mus.* VI. p. 64.

The type was taken at Blauwkop in the Zoutpansberg dist.

Key to the S. African species of the genus Blossia Simon.

A. Flagellum long and slender, widest near the base, tapering more or less gradually to the apex, and when directed forwards extending considerably beyond the tip of the upper jaw: basally, it is membranous with in-curved edges forming a more or less inflated capsule, with a greatly elongated aperture on the side adjacent to the jaw: distally, this gradually becomes a flattened rod.

a. On the lower margin of the fang of the upper jaw, between the tip of the fang and the first large pointed tooth, there is a tooth-like projection formed by a laterally compressed obtuse lamina.

1. Distal dorsal bristle with proximal half stout and minutely granular (except at the base), the distal half more slender, subulate, and smooth. Flagellum suddenly acuminate at the apex when seen from the side.

B. karrooica Purcell.

2. Distal dorsal bristle hardly reaching so far as the first pointed tooth, slender and quite devoid of granulation in any portion of its length, being precisely similar to the other bristles of the neighbourhood. Distal portion of the flagellum more slender than that of *karrooica*, and not so suddenly acuminate at the apex.

B. maraisi Hewitt.

b. No pronounced tooth-like lamina between the tip of the upper jaw and the first large tooth (it is represented by a minute tubercle or slight convex dilatation in *echinata*).

3. Distal dorsal bristle short¹, hardly reaching so far as the first tooth, its surface minutely granular. Basal half of flagellum of more or less uniform width, thence becoming gradually attenuated towards the apex where it is slightly hooked.

B. setifera Pocock.

4. Distal dorsal bristle almost reaching to the tip of the fang, its surface minutely roughened in the distal half. Flagellum with a broad basal half and a rod-like distal half fairly sharply differentiated. Dorsal edge of upper jaw furnished with a small sharp tooth which is almost midway between the base of the distal dorsal bristle and the tip of the fang.

B. echinata Purcell.

5. Distal dorsal bristle strong and boldly curved, reaching about as far as the anterior border of the second tooth, tapering more or less uniformly throughout its length, and not very strongly denticulated on any part of its surface. Flagellum very much broader towards the base than in the distal

¹ This character is inferred from the figure of the type.

portion, the whole structure being fairly regularly attenuated from the widened basal portion up to the apex. The first tooth of the upper jaw is much nearer to the second than to the tip of the fang.

B. falcifera Kraepelin.

6. Distal dorsal bristle very stout in its basal two-thirds, where the surface is rather strongly denticulated except near the base; then becoming attenuated rather suddenly, the apical third being slender, smooth and tapering to a fine point. Flagellum quite slender, being only slightly expanded at the base, and the distal half being practically uniform in breadth throughout. The first tooth of the upper jaw is as near to the second as to the tip of the fang.

B. filicornis Hewitt.

B. Flagellum short, not or scarcely surpassing the end of the fang when directed forwards, the distal portion being expanded into a widely open capsule, more or less oval or pear-shaped in outline, and the basal portion forming a distinct narrow stalk of attachment.

7. Distal portion of upper jaw with a long and straight upper margin, the first three teeth subequal in size, the third being followed by a fairly long straight interval, the fourth tooth being small. Distal dorsal bristle long and straight, minutely echinated in its distal half, which is as stout as the basal half.

B. crepidulifera Purcell.

8. Distal portion of upper jaw curved towards the apex; the single series is continuous and includes two strong pointed teeth distally, followed by two small teeth: between the more distal pointed tooth and the tip of the fang, is an inner blunt laminate tooth paired with an outer more conical tooth. Distal dorsal bristle undifferentiated.

B. litoralis Purcell.

9. Similar to *crepidulifera*, but the distal portion of the upper jaw is curved: the single series comprises two large distal teeth, a small third tooth, and a large fourth in a continuous series.

B. clunigera Kraepelin.

C. Flagellum a more or less pear-shaped capsule, with a wide elongated opening over the distal half or two-thirds of its length, the basal funnel-shaped part narrowed but not definitely petiolate.

10. Distal part of flagellum broad, densely covered with shaggy hairs. Outer wall of flagellum furnished with a strong well-marked yellow axis which terminates distally in a short sharp claw. Second abdominal segment inferiorly carrying two pairs of sickle-shaped fleshy hairs situated near the midline.

B. unguicornis Purcell.

11. Second abdominal segment inferiorly with two groups of three fleshy hairs near the midline. Flagellum without prickles or setae on its surface, although the distal edges are slightly frayed: the yellow thickened rib is very broad, and the amount of free membrane dorsal to it is much less than in *unguicornis*.

B. laticosta Hewitt.

12. Flagellum without a longitudinal thickened rib. Between the first large tooth of the upper jaw and the tip of the fang, there is a small obtuse tooth (which is absent in *unguicornis*).

B. tricolor Hewitt.

D. Flagellum like that of C, but widest about the middle of its length and gradually tapering distally to a slender apex.

13. Lateral wall of flagellum furnished along its middle with a thick pale yellow longitudinal rib, extending throughout the whole length: surface of flagellum thickly studded with prickles right up to the apex. Distal dorsal bristle becoming gradually thinner towards the apex, and covered with very minute spinules in its distal part. Third tooth of upper jaw rudimentary.

B. namaquensis Purcell.

14. Third tooth of upper jaw only a little smaller than the first or the second. Distal dorsal bristle precisely similar to the other bristles which occur on the upper and outer surfaces of the chelicerae, and with only a trace of short fine setose prickles on its distal portion. Surface of flagellum closely studded with minute triangular denticles, except towards the base, and on the narrowed distal portion.

B. laminiornis Hewitt.

E. Flagellum long, reaching beyond the tip of the fang when directed forwards; not very broad in any part, nor greatly attenuated either towards the apex or the base; the cavity of the slightly expanded capsule, which occupies the distal portion of the basal half of the flagellum, has a short oval aperture: the lancet-shaped distal half of the flagellum is lightly curved, and the membrane bordering it along the upper or anterior margin is very finely serrated from the capsule almost up to the apex.

B. fimbriata Kraepelin.

Genus Gluviopsis Kraepelin.

Gluviopsis australis Purcell, 1901. *Annals S. Af. Mus.* II. p. 219, fig. 8.

The type came from Styrkraal near the Orange River in the Kenhardt div.

This is the only species described from S. Africa, but Kraepelin gives some notes on a female example of the genus from Swakopmund.

The flagellum of *australis*—which is only known to me through the description and figure—is more or less oblong in shape, tapering towards the base, strongly compressed and bent outwards distally, the apex being very broadly subtruncated and lacerated. There are four large teeth in the single series of the upper jaw.

Genus Hemiblossia Kraepelin.

Hemiblossia bowvieri Kraepelin, 1899. *Das Tierreich*, p. 104, fig. 77.

This is based on a single female specimen from the upper Zambesi.

Hemiblossia O'neili Purcell [Pls. III, fig. 5 and VIII, fig. 42], 1901. *Annals S. Af. Mus.* II. p. 217, figs. 6 and 7.

This is based on several males and females from Dunbrody on the Sundays River. Also known to me from Alicedale (F. Cruden), De Aar (S. C. Cronwright-Schreiner) and Kimberley (Bro. J. H. Power). A figure of the flagellum of Alicedale specimens is given by me in *Records Albany Mus.* vol. III. p. 12. The inner surface of the chelicera in both sexes has stridulatory ridges, simple bristles, and feathered bristles, as usual.

Hemiblossia kalaharica Kraepelin, 1908. *Denk. med. nat. Gesell. Jena*, XIII. p. 279.

The type is a female from Khakhea in the Kalahari.

Hemiblossia idioceras Hewitt, 1917. *Ann. Natal Mus.* III. p. 687, fig. 1 a-c.

This is based on an adult male from Kimberley. The species seems well separated from *O'neili* in the characters of the flagellum, and it is of interest to note that both forms have been taken at Kimberley.

Mr Claude Fuller has taken this species at Pienaar's Riv. Transvaal: it occurred in numbers within the nest of a *Eutermes*. Mr J. H. Power also found adult males in a termites' nest at Kimberley, Nov. 1918.

Key to the species of Hemiblossia Kraepelin.

1. Dorsal margin of flagellum rather strongly curved, though not quite semicircular, and at its distal end is an independent process which is slender, curved and hairy: the distal margin of the flagellum is somewhat flattened out, but not into a distinct foliaceous appendage.

H. O'neili Purcell.

2. Dorsal margin of flagellum lightly curved, distally with an acutely pointed termination: distal margin of flagellum flattened out on the side adjacent to the chelicera into a foliaceous extension the margins of which are fringed with hairs.

H. idioceras Hewitt.

Genus Melanoblossia Purcell.

Melanoblossia braunsi Purcell, 1903. *Annals S. Af. Mus.* III. p. 6, figs. 4 and 5.

The type came from Willowmore, and a juvenile specimen was taken at Hanover.

Melanoblossia globiceps Purcell, 1903. *Annals S. Af. Mus.* III. p. 8, fig. 6.

Type from O'okiep in Little Namaqualand.

Key to the species of Melanoblossia Purcell.

1. "Flagellum" inconspicuous, being a straight hairy rod, like the setae immediately below it. Head-plate moderately convex, with notched setae of varying length, but not densely clothed with minute cylindrical bristles. Six small teeth in the single series of the upper jaw. Second abdominal sternite with two pairs of long narrow pointed fleshy hairs.

M. braunsi Purcell.

2. "Flagellum" similar, but much larger and more conspicuous. Head-plate strongly convex, the posterior surface rising vertically, the surfaces thickly covered with very short and numerous blackish brown cylindrical or pointed bristles. Four small recurved teeth in the single series of the upper jaw. Second abdominal sternite with 8-12 pairs of filiform fleshy hairs.

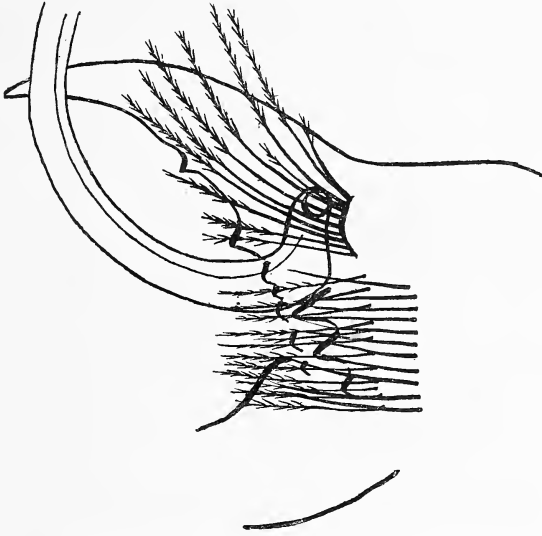
M. globiceps Purcell.

Genus Toreus Purcell.

Toreus capensis Purcell, 1899. *Annals S. Af. Mus.* I. p. 399, figs. 15-15 b.

Originally described as a species of *Ceroma*, the genus *Toreus* being afterwards founded for its reception (*Annals S. Af. Mus.* III. p. 9, fig. 7, 1903).

The type came from the farm Bergvliet in the Cape Peninsula. According to the description, the most striking feature of the species is that presented by the fang of the upper jaw, which is long and slender and divided into two portions: the shorter basal portion is directed forwards: the longer distal portion, which is a continuation of the median half of the basal portion, is bent sharply outwards from the base, forming a right angle with its fellow of the other jaw. The lower jaw is also strongly curved upwards and outwards at the apex. The single series of teeth in the upper jaw is represented only by a low black crenular keel without any separate teeth.



Text fig. 11. *Ceroma pictulum* Pocock. Mesial surface of upper jaw, with base of flagellum.

Genus Ceroma Karsch.

Ceroma sclateri Purcell, 1899. *Annals S. Af. Mus.* I. p. 395, fig. 13.

The type male came from Houwhoek, Caledon div. C.P.

An immature specimen was also recorded from Ashton, Robertson div. It was recorded from Damaraland in *Das Tierreich*, but this was evidently an error, as is now admitted by Kraepelin.

Ceroma inerme Purcell, 1899. *Annals S. Af. Mus.* I. p. 398, fig. 14.

The type male came from "Walfish Bay."

Ceroma pallidum Pocock, 1900. *Ann. Mag. Nat. Hist.* 7, v. p. 305, fig. 7.

The type male is from Garies in Little Namaqualand.

Ceroma pictulum Pocock [Pl. V, fig. 20 and Text fig. 11], 1902. *Ann. Mag. Nat. Hist.* 7, x. p. 8, Pl. II, fig. 2.

The type male was taken at Teafontein near Grahamstown. The species described by me under the name of *C. leppanae* (*Records Albany Museum*, III. p. 10, fig. 3) is probably referable to *pictulum*, although according to the donor of the specimen it came from Bulawayo. Mr S. Hirst has recently supplied me with notes on the type of *pictulum* as follows: flagellum very long and fine, reaching well beyond the hind margin of the head-plate, slightly expanded and truncate at the tip, the truncated edge being frayed out into short pointed processes, visible under the low power of a compound microscope: on the second and third legs, the patella has only a single very short spine at the distal end, and the tibia has three dorsal spines.

In the type of *leppanae*, there are no stridulatory ridges on the chelicerae: the upper surfaces of the chelicerae carry long stiffish bristles: the bristles protecting the base of the flagellum are all feathered: ocular tubercle elevated, being slightly but distinctly higher above the head-plate than in *Solpuga*, *Daesia*, *Blossia* or *Chelypus*: tarsus IV not spined: claws of tarsus I only just visible under a magnification of about 10 diameters.

The compact fan of feather bristles, protecting the base of the flagellum, arises from a short outstanding projection of the surface of the chelicera, and is presumably derived from the distal portion of the series of feather bristles that normally fringes the jaw in this family: nevertheless that series is represented in *pictulum* by a row of weakly developed feather bristles, more basally situated, and separated by an interval from the fan of stout bristles. The fan includes also one or two weak spines or simple bristles. As usual there is a row of simple bristles parallel to that of feathered ones.

The shaft of the flagellum resembles that of *Chelypus*. It is furrowed along its length and seems to be essentially a folded membrane: basally the furrow passes into a small inflation on the mesial side. It is rotatable at the base, a fact which seems to have been overlooked by Pocock, as well as by myself when describing *leppanae*: possibly the flagellum of other species may be fixed, for no one has hitherto recorded a rotatable flagellum in this genus.

Ceroma focki Kraepelin, 1914. *Beit. z. Kenntnis d. Land- u. Süswasserfauna Deutsch-Südwestafrikas*, p. 134, fig. 5.

The type male is labelled Windhuk.

Key to the S. African species of Ceroma.

A. The single series of teeth in the upper jaw composed of four teeth in a continuous row, the third being small. Flagellum comparatively short, considerably expanded in the basal half but narrower towards the apex.

1. Apex of flagellum filiform: the basal expanded portion protected on the mesial side by one strong spine and beneath it two bristles which are stout at the base and filiform at the apex. *C. pallidum* Pocock.

2. Apical portion of flagellum stouter, and bent strongly backwards into a hook: on the mesial side, the flagellum is flanked by two strong spines one near the base and one near the apex, whilst on the outer side there are three stout spines near the basal expanded portion. *C. focki* Kraepelin.

B. The single series of teeth in the upper jaw with only two teeth, the basal one much the larger, the distal tooth considerably separated

therefrom, being situated slightly in front of the anterior bend of the flagellum: flagellum long, reaching back well beyond the hind margin of the head-plate, not expanded into a pear-shaped enlargement at the base. Tibiae II and III with three short stout dorsal spines.

C. pictulum Pocock.

C. The single series of teeth in the upper jaw comprising two teeth, both rather large, not appreciably separated from each other. Flagellum long and slender.

1. Flagellum with a pear-shaped enlargement near the anterior bend, its apex reaching almost to the hind margin of the head-plate: tibiae II and III with three short stout spines dorsally.

C. sclaieri Purcell.

2. Flagellum strongly compressed laterally at the anterior bend, but at the basal end it is scarcely enlarged, its apex reaching to the hind margin of the ocular tubercle: tibiae II and III with several strong bristles dorsally.

C. inerme Purcell.

Genus Lipophaga Purcell.

Lipophaga trispinosa Purcell, 1903. *Annals S. Af. Mus.* III. p. 11, fig. 8.

The type came from Stompneus and Soldatenpost at St Helena Bay, C.P.

Lipophaga schultzei Kraepelin, 1908. *Denk. med. nat. Gesell. Jena*, XIII. p. 280, figs. 9-10.

This was originally described as the type of a distinct genus, *Pseudoblossia* Krpln., since recognised by its author as identical with *Lipophaga*.

The types came from Kamaggas in Little Namaqualand.

Lipophaga michaelsoni Kraepelin, 1914. *Beit. z. Kennt. d. Land- und Süßwasserfauna Deutsch-Südwestafrikas, Skorpiones und Solifugae*, p. 132, fig. 4.

The type came from Lüderitzbucht. A female from Okahandja was described at the same time, and referred with some doubt to this species.

Key to the species of Lipophaga Purcell.

1. The single dental series of upper jaw with six teeth, the third and sixth being largest, the first of moderate size. Terminal fang of upper jaw much shorter than that of lower jaw.

L. trispinosa Purcell.

2. Similar to *trispinosa*, but first tooth of upper jaw very much larger than the third, being in fact the largest of the series.

L. michaelsoni Kraepelin.

3. Terminal fang of upper jaw as long as that of the lower jaw.

L. schultzei Kraepelin.

In Kraepelin's definition of the genus *Pseudoblossia*, the tarsus of the fourth leg is said to be at least six times as long as deep, and the first leg without tarsal claws: the chelicerae have stridulatory ridges reaching almost up to the middle of the inner surface, the male with about 16 such ridges. Purcell's definition of *Lipophaga* includes: tarsus I with a pair of minute claws: chelicerae with a series of very short ridges at the anterior edge of the large smooth area.

Kraepelin referred the genus to the Daesiinae, but Purcell included it in the Karschiinae. The species are of moderate size, the adult male measuring $15\frac{1}{2}$ –17 mm. in total length, and the female $20\frac{1}{2}$ –22.

A series of female specimens belonging to this genus was taken recently by Dr R. Broom in the Campbell district: according to Dr Broom, the species is found over the dolomite area, extending from a point about 40 miles north of Campbell to 30 miles north-west of that village. In these examples the first tarsus is clawed: the tarsus of the fourth leg is about 5–6 times as long as deep, has no unguis appendages, and is rather densely clothed inferiorly with stiff setae: tibia III with a row of three very strong dorsal spines, also three weaker ones in a row posterior thereto: patella III with one strong spine at the apex dorsally: fourth leg without spines: the chelicerae have about 15 comparatively short stridulatory ridges, as shewn in the adjoining figure: the single series of teeth in the upper jaw is unbroken, the first and second teeth being of moderate size, the third large, the fourth moderate, the fifth and sixth rather large; coxa of palp with a long maxillary process: anterior margin of head-plate a little curved, upper surface with a well marked mesial groove and armed with long stiff setae and hairs like those on the chelicerae, with two



Text fig. 12. *Lipophaga* sp. Female example from neighbourhood of Campbell, shewing: *a*, the stridulatory ridges on the inner surface of the chelicera; *b*, the jaws viewed from the outer side.

prominent bristles in front of the ocular tubercle: the lateral portions of the head-plate are separated off from the mesial portion by a continuous suture as in *Chelypus*: in the interarticular membrane between the fourth and fifth sternites there is a distinct but minute median stigma: sides of abdomen only very sparsely hairy, the hairs being stiff and outstanding, with conspicuous pits arranged roughly in transverse rows.

The largest example measures 28 mm. in total length (including the chelicerae), the head-plate being 5 mm. broad.

Genus Hexisopus Karsch.

The family Hexisopodidae was constituted by Mr R. I. Pocock (*Ann. Mag. Nat. Hist.* 6, xx. p. 250) for the reception of the remarkable genus *Hexisopus*, which at that time was very imperfectly known. The adult male had not been described and one of the two known species was based on a very young specimen, so that a character now known to be common

to juveniles throughout the order, viz. the presence of only three malleoli on the hind limb, was represented as characteristic of *Hexisopus* and was even included in the definition of the family *Hexisopodidae*. Other more important characters were of course mentioned in the original definition and all later writers have agreed in recognising the family. The best account of the genus is that given by Dr Purcell (9) who sums up the principal points of distinction from the *Solpugidae* as follows: the absence of one joint of the trochanters in each leg of the three posterior pairs: the absence of claws in leg IV: the extreme shortness of the distal portion of leg IV in proportion to the basal part: the length of the distal segment of the claws in legs II and III: the minuteness of the third tarsal segments in these legs: the absence of subungual appendages in these legs: the presence of a genital papilla in the male: the shortness of the upper lobe of the rostrum.

Prof. Kraepelin in *Das Tierreich* also relies mainly on the characters of the legs in distinguishing this family from the *Solpugidae*: the great length of the segment now termed the trochantin and the shortness of the femur of the fourth leg is cited as an important character, and indeed the difference from the other known S. African genera in this respect is very striking. Other characters mentioned by Kraepelin in his diagnosis of the family, in addition to some of those emphasized by Dr Purcell, are:—mandibles with anastomosing stridulatory ridges: mandible of male almost toothless: ocular tubercle conical, forwardly projecting, and very hairy anteriorly: characters of the male flagellum.

In my opinion none of these characters can be regarded as equivalent in importance to those which distinguish the two main families of *Solifugae*, viz. the *Galeodidae* and the *Solpugidae*. The great reduction in length of the distal segments of the legs, the strong development of spines on these segments and the disappearance of the tarsal claws of the fourth leg are doubtlessly to be regarded as adaptation characters, in accordance with the burrowing habit: such differences between *Hexisopus* and a typical *Solpugid* can be compared with those which exist between our short limbed, stout bodied, burrowing frogs (*Rana delalandi* Tschudi) and the long limbed, slender, grass frogs (*Rana fasciata*) of the same genus, and indeed are not very much greater than those which separate the sedentary females of the genus *Stasimopus* (trap-door spider) from the free-living adult male of the same species. The supposed reduction in number of the trochanter segments is incorrect, being based on an error of homology. The number of tarsal segments, the absence of subungual appendages from the tarsi and the absence of claws on legs IV are characters of no great importance in view of the wide variation that is now known to occur on the several legs of true *Solpugids*. The shortness of the upper lobe of the rostrum is apparently a feature peculiar to *Hexisopus*, and is not found in the closely related genus *Chelypus*. The stridulatory area of the chelicerae, which in *Chelypus* is not ribbed but marked with fine and quite irregular furrows, seems to be much more like that of a normal *Solpugid* in some species of *Hexisopus* where parallel stridulating ribs are present: in any case, however, the character is not of great value seeing that in the same species of *Solpuga* ribs may be

fully developed in the female but quite absent in the male. The ocular characters vary very considerably in the several Hexisopodid species, and even in the same species between male and female. The dentition of the chelicerae is a most unsatisfactory character from a systematic point of view.

The differences between the families Solpugidae and Galeodidae are apparently of a major-type, at any rate not connected with habitual differences. The Galeodidae have the stigmata of the second and third abdominal segments opening beneath the posterior edge of the sternites and protected by a pair of transversely elongated finely toothed plates the Serrulae: the stalks of the tarsal claws are hairy: the tarsus of the palp is freely articulated with the tibia. In the Solpugidae there are no serrulae protecting the abdominal stigmata (the modified hairs on the sternites in the Daesiinae may be homologous therewith), which are plainly visible on the posterior margins of the sternites: the stalks of the tarsal claws are not hairy: the tarsus of the palp is immovably attached to the tibia, or is only slightly movable thereon as in Daesia. In these characters, the Hexisopodidae agree entirely with the Solpugidae and I therefore propose to unite the two into one family, Solpugidae, where the Hexisopodid genera have the subsidiary rank of a subfamily, the Hexisopodinae.

In respect to the form of the head-plate and of the first thoracic tergite, the Hexisopodid genera seem to shew considerable resemblance to the genus Rhagodes as figured by Mr H. M. Bernard in his paper on the "Comparative Morphology of the Galeodidae" (*Trans. Linn. Soc. Lon.* 2nd Ser. Zoology, vol. vi. Pl. 27, figs. 6 and 7). These genera also resemble Rhagodes, more or less clearly, in the dentition of the chelicerae, in the shortness of the legs, in the small size of the eyes, and in the rather large size of the anal segment. Assuming the accuracy of Mr Bernard's figure, there is another interesting point in which Rhagodes differs from ordinary Solpugids and tends towards Hexisopus: the claw of the fourth leg is represented as smaller than that of the third leg, whereas in all genera found in S. Africa, except Hexisopus and Chelypus, the claw of the fourth leg is greater than that of any of the preceding legs. I may add that the Rhagodinae and Hexisopodinae will probably be found to occupy adjoining geographical areas, the genus Rhagodes extending southwards as far as Masailand, and the western genus Chelypus being known to me from North West Rhodesia. However, in the absence of actual material for an exact comparison between Rhagodes and the Hexisopid genera, it would be unwise as yet to lay too much stress on these points, which may prove to be explicable as the results of convergent evolution rather than of genetic affinity. At present, indeed, it is impossible to assert with any degree of confidence whether or not the Hexisopodid genera should be regarded as derivatives of the same immediate stock as gave rise to the other Solpugid genera in S. Africa.

The Hexisopodinae are probably more nearly related to the Karschiinae than to either of the other S. African subfamilies.

I have observed one character in Chelypus, and less distinctly in

Hexisopus, that does not appear to be present in the better known S. African genera: this is the median tracheal stigma of the fourth abdominal sternite, which however is quite small. The same stigma occurs in *Galeodes*, but not in *Rhagodes* according to H. M. Bernard¹. I have noticed it in female examples of the genus *Lipophaga*.

Hexisopus lanatus C. L. Koch [Pl. VIII, fig. 41], 1842.

Purcell in *Annals S. Af. Mus.* I. p. 384, figs. 1-7 *b*, also II. p. 221.

Recorded by Dr Purcell from localities in Namaqualand, C.P., viz. Grasmond between Steinkopf and Ramond's Drift, and from Vuurdood near Ramond's Drift, also from Bladgrond in Gt Bushmanland. Kraepelin records it from Keetmanshoop and Kabus in Gt Namaland.

Hexisopus crassus Purcell, 1899. *Annals S. Af. Mus.* I. p. 387, figs. 8 and 8 *a*.

This is founded on a single female example from Worcester. C.P.

Hexisopus nigrolumatus Kraepelin, 1899.

Das Tierreich, p. 151, fig. 117.

Founded on an adult male from Damaraland.

Hexisopus infuscatus Kraepelin, 1899. *Das Tierreich*, p. 151, fig. 118.

The type is an adult male from Walfish Bay.

The species does not seem to be very different from *lanatus* judging from the description.

Hexisopus reticulatus Purcell, 1901. *Annals S. Af. Mus.* II. p. 222, fig. 9 *a* and *b*.

The type is an adult male taken near the Orange River between Bysteeek and the Great Falls at Aughrabies.

Hexisopus fodiens Simon, 1887. *Ann. Soc. Ent. France*, 6. 7, p. 374, Pl. VI, figs. 6 and 7.

The type is an immature example from the Kalahari, and presumably the species is indeterminable. Dr Purcell has remarked on certain peculiarities (9) in Simon's figure of this species, and I may add also that the distal portion of the palp is represented with quite unique features—having apparently a lobe on the tarsus, and the latter freely articulated with the tibia—which however are not referred to in Simon's description. The figure is probably hopelessly inaccurate.

Key to the species of the Genus Hexisopus.

1. From the anterior edge of the basal cup, the shaft of the flagellum passes forwards, upwards, backwards and finally downwards in a bold curve, terminating just behind the base of the lower jaw, not far from the basal cup: the shaft is more or less cylindrical and tapers gradually to a slender apex. *H. lanatus* C. L. Koch.

¹ According to Sorensen's account, the median spiracle would seem to be normally present in Solifugae. Hansen recorded it in the genus *Rhagodes*.

2. The shaft of the flagellum is of more uniform thickness and does not taper gradually to a slender apex, the distal end being strongly compressed, blade-like, and slightly dilated: the shaft moreover is not curved throughout its length, the upper portion being directed backwards in a straight line for a considerable distance. Lower jaw long, slender, strongly curved, with a small tooth behind the middle.

H. reticulatus Purcell.

3. Towards the apex of the flagellum, the shaft presents for a short distance a small membranous expansion along the lower side: this terminates quite abruptly near to the distal end which is drawn out to a fine point. The lower jaw has a fairly large tooth with a horizontal upper edge, the distal end of the tooth being nearer to the apex of the jaw than to its base. Upper jaw with two small teeth near to the point of origin of the flagellum.

H. nigrolunatus Kraepelin.

4. Similar to *lanatus*, but tibia of palp with short cylinder bristles over the whole extent of the upper surface, the cylinder bristles of the lower surface being short distally, but those near the base of the segment gradually become longer, exceeding twice the length of the distal bristles. (In *lanatus* the tibia of the palp, dorsally and ventrally, is said to carry long hairs, rather long bristles and between them some short isolated cylinder bristles.)

H. infuscatus Kraepelin.

Genus Chelypus Purcell.

Chelypus barberi Purcell, 1901. *Annals S. Af. Mus.* II. p. 224, fig. 10.

The type is a male from a locality in Bechuanaland about 100 miles south of the junction of the Moshowing with the Molopo Rivers. The Transvaal Museum has a specimen labelled Rietfontein, Gordonia, which seems referable to this species. In this specimen, the chelicerae are not densely covered with minute pointed spinules on the upper surface, but have short subspiniform setae and some very minute spinules. The cup-like basal enlargement of the flagellum narrows into a rounded solid head which fits closely into a hemispherical depression on the surface of the chelicera.

Chelypus lennoxae Hewitt, 1912. *Records Albany Mus.* II. p. 312.

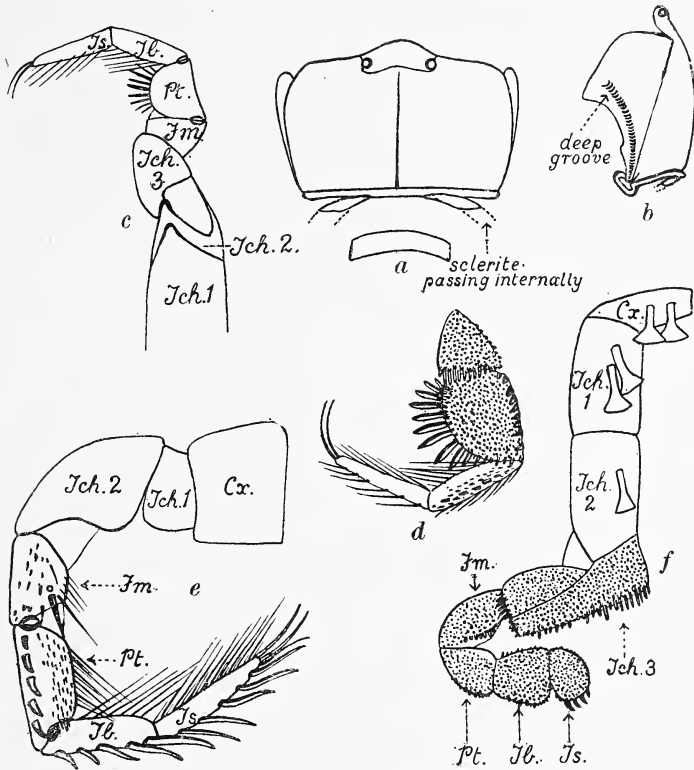
The type came from Upington.

This species is remarkable in its dark colouration, the hairs of the abdomen superiorly being brown or dark brown, and the sides quite deeply infuscated: the fourth femur is rather long when compared with the trochantin: the chelicera has comparatively coarse, black, pointed spinules on the outer portion of the upper surface and on the upper portion of the outer surface, whilst a prominent oblique patch of strong pointed spinules occurs on the mesial surface near to the base of the fang superiorly: the furrows of the stridulatory area are very long, and in general longitudinally arranged: a distinct ocular tubercle is not present, but the area on the mesial side of each eye is slightly raised: the abdominal tergites are well defined.

Chelypus hirsti Hewitt [Pl. VIII, fig. 45 and Text-fig. 12], 1915. *Annals Natal Mus.* III. p. 323, figs. 8 and 9.

The types were taken at Rietfontein in Gordonia.

The following notes may be added to the original description: eyes about seven or eight diameters apart, being situated on a more or less distinct ocular tubercle which is quite twice as broad as long and almost subdivided by a median depression into two tubercles: this ocular region projects forwards a little in front of the more lateral portions of the head-plate but is not nearly so forwardly produced as in the males of *Hexisopus*, where the eyes are much nearer together according to Purcell's accounts. Inner surface of chelicerae without feathered bristles, and with no row of spines nor even stiff bristles on the upper jaw: stridulatory area rather large, with a reticulation of furrows.



Text fig. 13. *Chelypus hirsti* Hewitt. *a*, Head-plate and thoracic tergites seen from above. *b*, Head-plate seen from the side. *c*, Third leg viewed from its upper side (this leg is considerably twisted). *d*, Distal segments of same, more enlarged, in ventral view. *e*, Second leg and *f* fourth leg.

Coxa of palps with a fairly prominent maxillary lobe: this is not so long as that of *Solpuga*, but is longer and more conspicuous than in *Daesia*. The palp has very stout spines on its surfaces, four on the tarsus, about 11 on the tibia, and several on the patella. Claws of second and third legs of two segments, but the basal segment is almost obsolete, being about one-twelfth as long as the distal segment: according to Dr Purcell, this character may vary considerably amongst the individuals of the same species (*Hexisopus lanatus*).

The anal slit is large, and the whole segment moderately large. A small median spiracle on the fourth abdominal sternite, which is also traceable in

the male of *Hexisopus lanatus* but only indistinctly in the female: thoracic spiracles very large. There is a general absence of bristles or stiff hairs on the surfaces of body and appendages, but numerous long soft and low-lying hairs occur.

Key to the S. African species of Genus Chelypus.

1. Shaft of flagellum directed forwards, upwards, backwards, and downwards in a bold curve, the apex bifid, with a short tooth-like medial branch and a longer lateral branch. Dorsal surface of upper jaw with two very large black tubercles distally. Tibia of fourth leg longer than the tarsus, and broader than the patella, but not lobed: tarsus of fourth leg broader than long. Claws of second and third leg composed almost entirely of the distal segment, the proximal segment (claw peduncle) being extremely short and indistinctly marked off. *C. barberi* Purcell.

2. Similar to *barberi* but flagellum not bifid at the apex but tapering to a point. *C. hirsti* Hewitt.

3. Dorsal surface of upper jaw with only one large tubercle. Tibia of fourth leg with a large rounded lobe projecting externally and densely covered with short spinules. Tarsus of fourth leg longer than broad. Distal segment (claw proper) of tarsal claw of third leg less than half the total length of the claw and distinctly marked off from the proximal segment (claw peduncle). *C. lennoxae* Hewitt.

ADDENDUM

Solpuga niassa Karsch var. nov. *kafulica* [Text fig. 14].

What seems to be a distinct variety of this species is known to me from Kafula Futa, N. Rhodesia (Rev. C. M. Doke). The male presents considerable features in common with *schönlandi*, and, I think, will probably prove to be completely connected therewith by intermediate forms. It differs from *schönlandi* as follows: the flagellum is more slender and a little longer, the apex reaching back beyond the hind border of the basal enlargement, the recurrent portion of the shaft tapering from its commencement, rather rapidly so near the anterior bend, becoming somewhat twisted outwards distally, the apex rather bluntly pointed and with no distinct projecting core: the terminal fang of the upper jaw has the inner dorsal tooth almost obsolete: the lower border of the terminal fang well curved. Only one intermediate tooth in the single series of the upper jaw. Basal enlargement of flagellum markedly elevated as in *schönlandi*.



Text fig. 14. *Solpuga niassa kafulica* sub sp. nov. Left upper jaw of male viewed from mesial side.

In the female, there are indications of a second intermediate tooth in the upper jaw: this, which is actually the third tooth, is much smaller than the fourth, which again is considerably less than either the second or fifth.

Measurements: breadth of head-plate M. 7, F. 13; length of patella of palp M. 12, F. 14; of tibia and tarsus of palp M. 12.3, F. 14.8; of patella of fourth leg M. 10.5, F. 12.25.

According to Kraepelin's figure of *niassa* in *Das Tierreich*, the upper jaw of the male has two well developed intermediate teeth, and the flagellum has peculiar serrations on its shaft, which are not in any degree represented in the specimen from Kafula Futa. The new variety is related also to *S. rhodesiana* Hirst (*Manchester Memoirs*, LVI, 1911, No. 2, p. 8) which has two intermediate teeth in the upper jaw, whilst the flagellum is sharply pointed at the apex and distinctly shorter than that of *kafulica*.

EXPLANATION OF PLATES

PLATE I.

Fig. 1. *Solpuga venator* Poc. Adult female from Keetmanshoop.

PLATE II.

Fig. 2. *Solpuga chelicornis* Licht, var. nov. *pubescens*. Adult male from De Aar.

Fig. 3. *S. chelicornis* Licht, var. nov. *rufescens*. Adult male from Loughope.

Fig. 4. *S. derbiana* Poc. Adult female from Grahamstown.

PLATE III.

Fig. 5. *Hemiblossia O'neili* Purcell. Adult female from Alicedale: enlarged.

Fig. 6. *Solpuga sericea* Poc. ? sp. (possibly *celeripes* Hirst). Female from Salisbury.

Fig. 7. *S. lineata* Koch. Male from Alicedale.

Fig. 8. *S. chelicornis* Licht, var. nov. *rufescens*. Female from Dirkskraal.

Fig. 9. *S. venator* Poc. Chelicera of adult female from Thorn Kloof near Grahamstown: enlarged.

Fig. 10. *S. venator* Poc. Abdomen of adult female in ventral view.

Fig. 11. *S. chelicornis* Licht. Abdomen of adult female in ventral view.

PLATE IV.

Fig. 12. *Solpuga venator* Poc. Chelicera of adult male from Alicedale: enlarged.

Fig. 13. *S. strepsiceros* Kraep. Chelicera of adult male from Barberton: enlarged.

Fig. 14. *S. bechuanica* Hewitt. Chelicera of adult male from Serowe: enlarged.

Fig. 15. *S. schlechteri* Purc. Chelicera of adult male from Keimoes: enlarged.

Fig. 16. *S. hostilis* White. Ventral surface of trunk of adult male from Pretoria.

Fig. 17. *S. hostilis* White. Ventral surface of trunk of adult female from Pretoria.

PLATE V.

Fig. 18. *Solpuga spiralicornis* Purcell. Chelicera of adult male from Griffin Mine, Leydsdorp: enlarged.

Fig. 19. *S. ornithorhyncha* Hewitt. Chelicera of adult male from the neighbourhood of Kraikluft: enlarged.

Fig. 20. *Ceroma pictulum* Poc. Chelicera of adult male described as *C. leppanae* mihi: enlarged.

Fig. 21. *Solpuga globicornis* Kraep. Chelicera of adult male from Pretoria dist.: enlarged.

Fig. 22. *S. suffusca* Hewitt. Chelicera of adult male: enlarged.

Fig. 23. *S. maraisi* Hewitt. Chelicera of adult male from Stellenbosch: enlarged.

Fig. 24. *S. lateralis* Koch. Chelicera of male from Bussacks: enlarged.

PLATE VI.

Fig. 25. *Zeviassa purcelli* Hewitt. Chelicera of female specimen from Newington: enlarged.

Fig. 26. *Solpuga fusca* Koch. Chelicera of female specimen from Capetown: enlarged.

Fig. 27. *Daesia lineata* (Pocock). Chelicera of adult male from De Aar: enlarged.

Fig. 28. *D. lineata* (Poc.). Female example from De Aar.

Fig. 29. *Solpuga hostilis* White. Chelicera of male example from Doornkop: enlarged.

Fig. 30. *S. marshalli* Poc. Chelicera of adult male from Salisbury: enlarged.

Fig. 31. *Daesia lineata* (Poc.). Male example from De Aar: enlarged.

Fig. 32. *Solpuga celeripes* Hirst. Chelicera of adult male: locality unknown.

Fig. 33. *S. lineata* Koch. Chelicera of adult male from Alicedale: enlarged.

PLATE VII.

- Fig. 34. *Solpuga alcicornis* Kraep. Chelicera of adult male from Kuruman: enlarged.
 Fig. 35. *S. tubicen* Kraep. Chelicera of adult male from locality unknown: enlarged.
 Fig. 36. *Zeriassa purcelli* Hewitt. Chelicera of male from Newington: enlarged.
 Fig. 37. *S. lethalis rectus* var. nov. Chelicera of male from Windhuk: enlarged.
 Fig. 38. *S. montei* Poc. Chelicera of male from Rustenburg dist.
 Fig. 39. *Blossia unguicornis* Purcell. Adult female from Alicedale: enlarged.
 Fig. 40. *B. unguicornis* Purcell. Adult male from Alicedale: enlarged.

PLATE VIII.

- Fig. 41. *Hexisopus lanatus* Koch. Male example in ventral view: enlarged.
 Fig. 42. *Hemiblossia O'neili* Purcell. Fourth leg of female example from Alicedale: enlarged.
 Fig. 43. *Daesia lineata* (Poc.). Ventral view of anterior portion of abdomen of male, showing first three sternites and basal segments of fourth leg: enlarged.
 Fig. 44. *Blossia unguicornis* Purcell. Ventral view of abdomen of male: enlarged.
 Fig. 45. *Chelypus hirsti* Hewitt. Chelicera of male from Rietfontein, Gordonia: enlarged.
 Fig. 46. *Blossia unguicornis* Purcell. Fourth leg of male from Alicedale: enlarged.

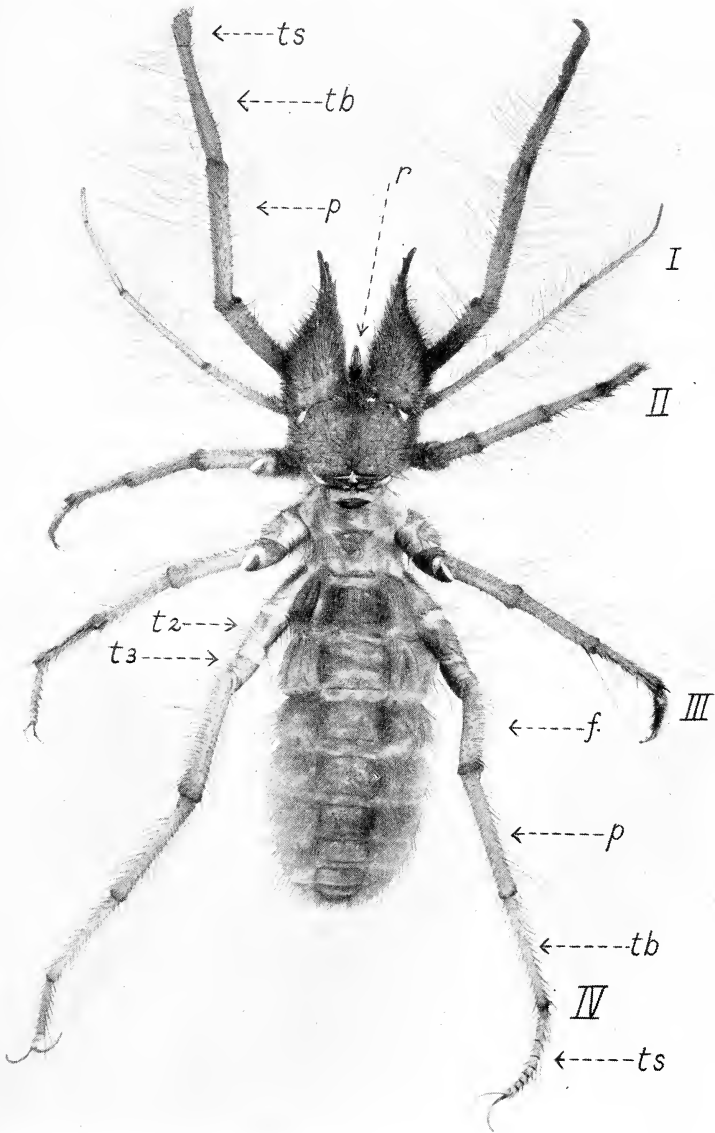
LIST OF RECENT LITERATURE ON THE
S. AFRICAN SOLIFUGAE

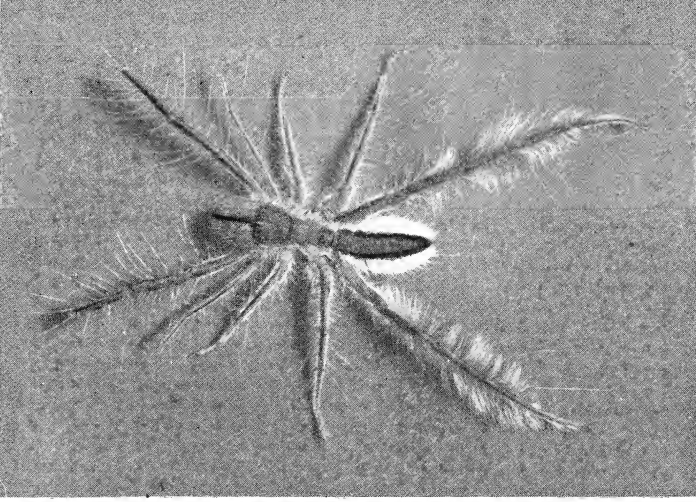
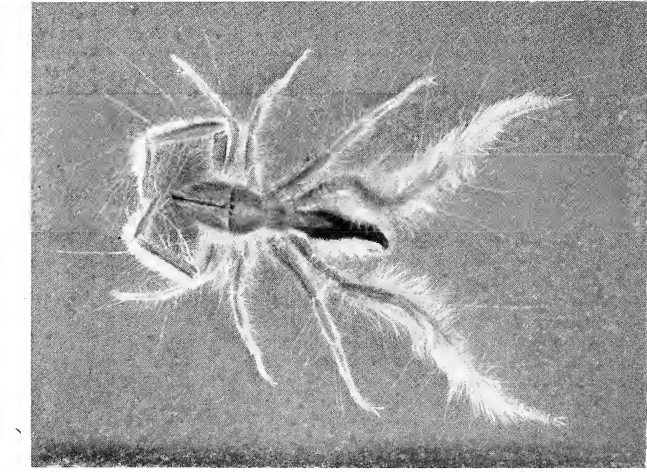
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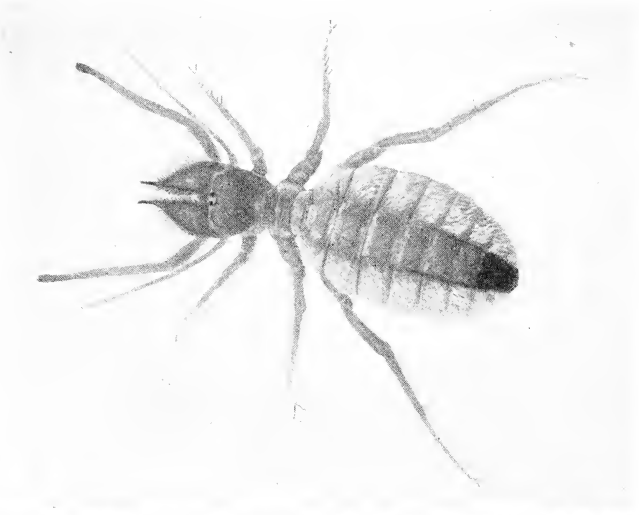
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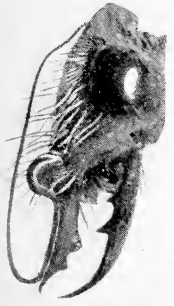
Diurnal Solifugae











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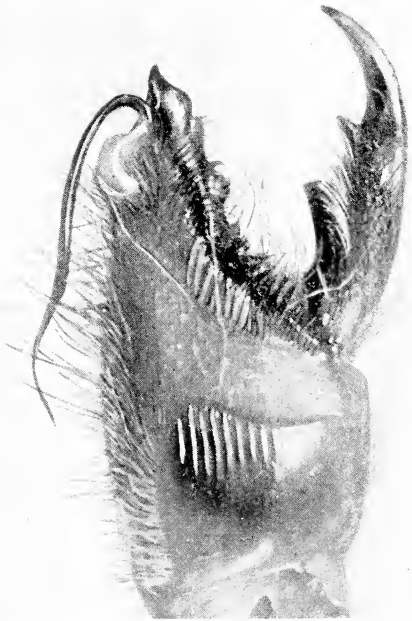
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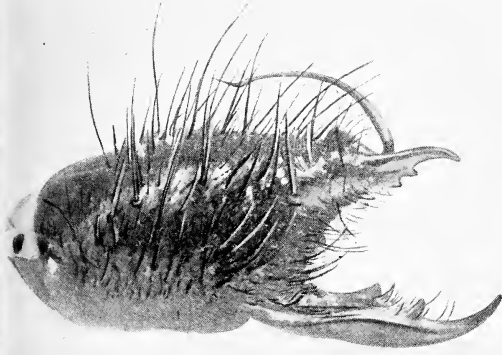


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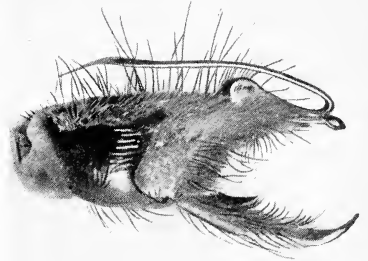


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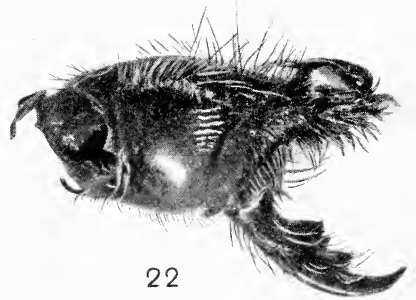
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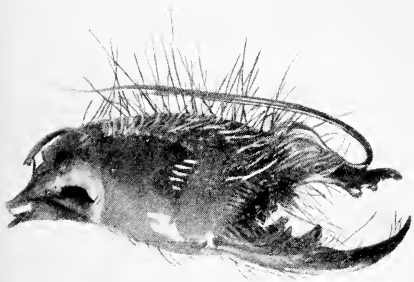
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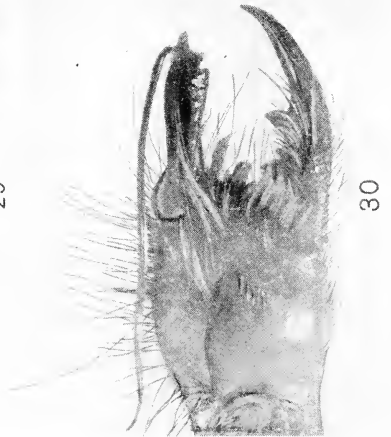
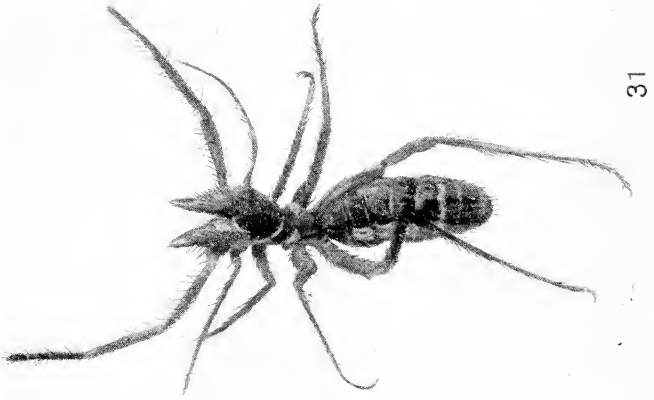


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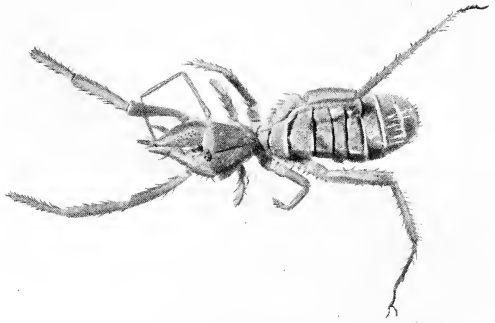




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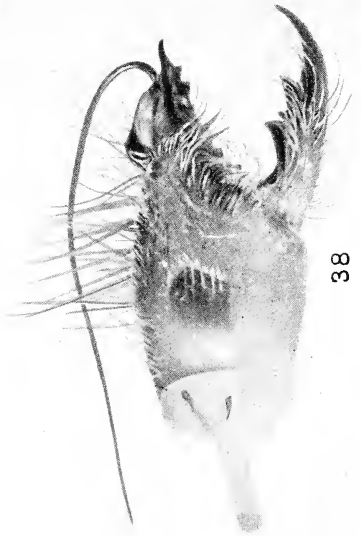
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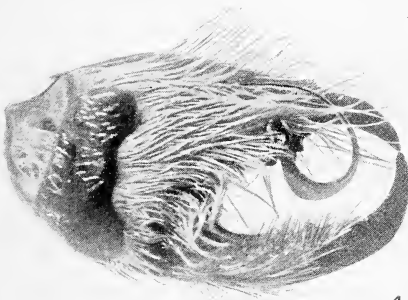
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46

ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VII

PART 2 *containing*

Contributions to the Knowledge of the Reptiles of the Karroo Formation. By Dr E. C. N. VAN HOEPEN, M.I.

5. A New Dinosaur from the Stormberg Beds. (With 2 plates and 6 text-figures.)
6. Further Dinosaurian Material in the Transvaal Museum. (With 13 plates and 27 text-figures.)

Description of some Cretaceous Ammonites from Pondoland. By Dr E. C. N. VAN HOEPEN, M.I. (With 3 plates.)

Issued March 10th, 1920

PRINTED AT THE UNIVERSITY PRESS

CAMBRIDGE, ENGLAND

1920

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CONTRIBUTIONS TO THE KNOWLEDGE OF THE
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By DR E. C. N. VAN HOEPEN, M.I.

5. A NEW DINOSAUR FROM THE STORMBERG BEDS.

With two plates and six text-figures.

In November of 1915 the Transvaal Museum bought the remains of a small *Dinosaur* from a resident of Ficksburg. The specimen had been discovered in a building-stone quarry near Roosendal, O.F.S. This is most probably the same quarry in which the small *Pseudosuchian Pedeticosaurus Levisiuri* has been found. During the usual quarrying work a stone was split and found to contain the remains of some animal. The little village of Roosendal was very interested in the find and in due course photographs of the fossil were sent to friends. One of these photographs reached my friend Mr A. W. PUTTERILL of Harrismith, who sent it on to me with the necessary information. Through this report the Transvaal Museum eventually came into possession of one of its best specimens. I have therefore great pleasure in thanking Mr PUTTERILL for the service he has rendered to our institution in particular and to science in general.

It follows, from the above, that the remains are on two slabs of rock. They consist of a nearly complete skeleton. The skull is lost or at least not visible, for it is not impossible that it is present in a more or less fragmentary condition under some of the other bones. Two jaw portions with some teeth are exposed. The neck vertebrae have been crushed sideways into a heap. All the dorsal vertebrae are more or less articulated as also a fair number of caudals. The front legs are incomplete, but the hinder extremities are very well preserved. The shoulder girdle is only represented by two coracoids and the proximal ends of the scapulae, while the pelvis shows all its constituents of which some are in very good condition. All the bones, however, have been much flattened.

SKULL.

A large part of a left maxillary and the front end of probably the left ramus of the lower jaw are present. The length of the lower maxillary border as preserved is about 29 mm. It bears six teeth or remnants of teeth and in front of the foremost one is the crown-tip of another one, which was probably also on the maxillary. Behind these six the rock only shows a brown blur and nothing definite can be made out. The hinder end of the alveolar border is only indicated. The front end of the maxillary and the greater part of the front border of its nasal process are covered by the coracoid. The anterior lower corner of the antorbital vacuity is rounded and wide-angled. A portion of the inner wing of the nasal process is still present.

The lower jaw portion is very much damaged and sutures cannot be made out. It shows three teeth and fragments of four others. Its length is about 25 mm.

It seems as if the maxillary teeth slightly increase in size forwards. The four preserved tips of the dentary teeth occur at the same level and these four teeth were therefore probably of equal length. The roots of the two foremost ones have been partially laid open and a small replacing tooth is seen in front of the first one. Another young tooth, which is still below the edge of the supposed dentary, was laid bare through removal of part of the bone and the root of the fourth tooth present. The crowns of the teeth are broad and flat and have the edges serrated. They are not pointed but rounded at the top and on one side at least there is a low broad ridge, which runs from the base along the middle to the upper edge. The denticles of the serrated edge have a blunt point, and the notches are angular. This angle appears to be very large, in some cases where the notch is clearly visible it shows an angle of some 60° . In young teeth, however, the condition seems to be different. The young tooth below the root of the fourth one shows a portion of its edge with four small denticles. In a lateral view these denticles are long and cylindrical, and before being well cleaned of matrix the notches seemed to have the shape of a long stretched U. After the matrix had been carefully removed, however, it appeared that the denticles are united to such an extent that only their tips are free. The actual notch is slight and nearly rectangular, but continues on to the tooth surface as a parallel concavity between the denticles for about three times its real depth. Length of the crown of the best preserved maxillary tooth 5 mm., breadth 3.5 mm. In this tooth three denticles occupy the space of 1 mm. The crown of the young tooth has a length of 3.5 mm. and its four denticles stand on 1.3 mm.

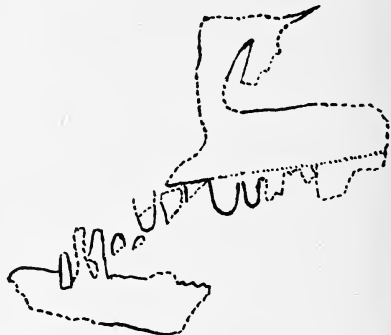


Fig. 1. Portion of maxillary and dentary with teeth as preserved. Nat. size.

CERVICAL VERTEBRAE.

All the cervical vertebrae have been crushed sideways into a heap. They have been very much flattened and broken and only three are sufficiently free from the others to be of any use. Two of these are very long and their place seems to be in the hinder region of the neck. The length of the centra of both is 31 mm. The ventral surface of one centrum is exposed and the breadth of

the bone is 9 mm. This ventral surface is deeply concave. The breadth of the hinder articulation surface is 14 mm.; that of the front end is smaller. Nothing is visible of diapophyses or parapophyses. The praezygapophyses are short, pointed and wide apart. The postzygapophyses are longer. The height of the front articulation surface of the vertebra, where all these dimensions are taken from, is 10 mm. The third vertebra is very much shorter and is the only neck-vertebra showing a dorsal spine. The height of this vertebra, with its spine, measured in the middle of its length is 19 mm. The length of the spine (*i.e.* from the anterior to the posterior end) is 18 mm. The height of the hinder articulation surface is 10 mm. This seems to be one of the foremost vertebrae of the neck.

DORSAL VERTEBRAE.

The total number of dorsal vertebrae is 14. The vertebra which I take to be the first dorsal is largely covered by the coracoids. It is not impossible, although I think it very improbable, that there is another dorsal vertebra in front of this one.

The first seven vertebrae are still articulating, but the eighth is displaced. The ninth to the fourteenth are also more or less in juxtaposition. They all lie on their left side and through the splitting of the stone all the vertebrae have been broken and greater or smaller portions of each are still in both slabs. Therefore, generally speaking, no detail of the outer surface of the vertebrae is visible. Their principal measurements are

Dorsal vertebra No.	I*	2	3	4	5	6	7	8	9	10	11	12	13	14
Length of the centrum		20	21	23	24	24	24	26	28	29				
Height of front articulation surface			15		15	16		17						
Height of hinder articulation surface				15	15	15		15	17		19			
Total height		36	37	37	38	39	39	37	40					
Length of dorsal spine			16	19	22		22		22	21				

From these figures and from the plates it will be seen that the vertebrae do not differ much in size. The length of the centra seems to increase slightly and gradually towards the pelvis. The dorsal spines are thin, long and low. Their front upper corner is rounded and their upper hinder corner more pointed and overhanging. Their upper border is evenly rounded, and its general direction diverges slightly backwards with the axis of the centrum. The praezygapophyses project far beyond the plane of the anterior articulation surface of the centrum. The postzygapophyses are shorter, but still project well beyond the plane of the posterior articulation surface. There is a round opening between the praezygapophysis and the anterior vertebra, which apparently served as an exit for a spinal nerve. The vertebrae are amphicoelous, but the only articulation surface visible is the rather deep depression on the hinder end of the first vertebra. The neural arch is attached to the centrum by a suture, which is plainly visible in the third to the sixth, the eighth to the tenth and the twelfth vertebra. This suture is seen on the outer surface of the vertebra as a zig-zag line, the general direction of which is parallel to the axis of the centrum. The amplitude of the undulations of this line seems to lie within certain limits, which are reached by many individual waves. The connection seems to have been a loose one and could only have prevented the neural arch from moving in a direction parallel to the axis of the centrum. Apparently centra and neural arches became easily disconnected, for this is more or less the case in five vertebrae.

Ribs are present near all the vertebrae except the fourteenth and it is very probable that this vertebra did not bear ribs. The animal would then have

a single lumbar vertebra. The anterior ribs are long and slender, while the posterior ones are short. In some of the ribs the proximal end is complete and is seen to be double-headed.

SACRAL VERTEBRAE.

There is not much visible of the sacral vertebrae. The second shows its ventral surface, while the third shows its left side and partly its ventral surface. The posterior end of the first sacral protrudes from under the proximal end of the right ischium. The length of the centrum of the third sacral is 15 mm., while that of the second is 26 mm. The anterior corners of the ventral surface of the second sacral are truncated, probably by the articulation faces for the sacral ribs. These truncations reach backwards till past the middle of the ventral surface. A similar truncation is visible at the left anterior corner of the surface shown by the third sacral.

There is a large brown patch with remains of bone to the right of the second sacral. I take this to be the second sacral rib of the right side. It lies at a distance of about 1 cm. from the vertebra. As preserved, the proximal end of this rib is very narrow and the distal end very broad. The anterior edge shows the original margin of the bone, which is very concave. None of the other margins have been preserved, except the anterior portion of the distal margin. The anterior portion of the distal end is very thin, and its outer margin is convex; its upper surface is concave. The upper surface of the posterior portion of the distal end seems to have been convex and the whole distal end therefore shows a wavy appearance. The breadth of the distal end as preserved is 31 mm. and that of the proximal end 14 mm. The length of the rib as preserved is 20 mm. Behind the second there are remains of the third sacral rib. This is accompanied by its fellow on the other side of the third sacral vertebra. Both ribs lie at a distance of about 1 cm. from the vertebra. They are very badly preserved, but the contour of the distal end of the right rib seems to be complete on the slab figured on Plate IX. The anterior and posterior margins of the ribs are concave and the distal end is broad. Its outer margin is convex. The third sacral rib is very much narrower than the second. The length of the rib on the right is 21 mm., the breadth of its distal end 14 mm. and that of its proximal end 7 mm.

The third sacral vertebra has been identified as such through analogy with other *Anchisauridae* and *Plateosauridae*. The specimen itself does not show any character which would class it immediately as sacral; on the contrary, its size and the shape and size of its sacral ribs agree so closely with the corresponding properties of the first caudal vertebrae, that without the knowledge of other *Theropoda* one would without doubt regard it as the first caudal. Moreover, there is some doubt with regard to the second sacral. There is a slight suggestion in its shape that it represents two coalesced vertebrae; if these are the first and second sacrals, then it is difficult to conclude what the small bone may be which protrudes from under the right ischium. Its convexity and its convex free border strongly suggest the hinder end of a lower surface of a vertebra. Could it perhaps be a fifteenth dorsal? I doubt it and therefore I have regarded it as the first sacral. However, what is here called second sacral may be the coalesced second and third. But this is very improbable, because of the first sacral not being coalesced. Moreover, the second sacral rib seems to form an unbroken series with what has been styled the third sacral rib and the first three transverse processes; the actual third sacral rib would then be missing. I do not see any reason which forces one to this conclusion, and therefore I have described these bones as above. Still it is

very probable that the third sacral rib was too short to reach the ileum, notwithstanding normal backward convergence of the ilea. However, this may be explained in the same way as certain differences in *Theropod* sacra by v. HUENE (3¹, p. 281). As appears from many loose sutural connections, our animal is a young individual, and has not yet reached the stage of life in which it possesses a true third sacral vertebra.

CAUDAL VERTEBRAE.

Of the caudal vertebrae only twelve have been preserved. The first two caudals are present. The first caudal lies immediately behind the last sacral and the second caudal behind the first. Then follows a large gap. After this comes a series of eight vertebrae. Two more vertebrae can be recognised in a jumbled up mass at the end of this series.

The centrum of the first caudal has a length of 15 mm. That of the second cannot be accurately measured, because it has split obliquely. It is also difficult to measure the height of the centra, but the dimension seems to be slightly less or equal to the length. The lower portion of the hinder articulation surface of both centra has been obliquely truncated to form an articulation surface for the haemapophysis. In the second caudal it is clearly visible that the lower portion of the front articulation surface bends slightly backwards. The transverse processes of the right side have both been disjointed and their impressions lie at a distance of about 2.5 cm. from their respective vertebrae. They lie in a row with the second and third sacral ribs. The process of the first caudal has a length of 18 mm. and a breadth of 10 mm. These measurements of that of the second caudal are respectively 16 mm. and 10 mm. Both processes show great resemblance to the third sacral rib.

The series of eight vertebrae is from the middle region of the tail. The centra are very long and low and they all show their lower surface and that of their right transverse process. The dorsal spines of all these vertebrae are embedded in the rock and invisible. The centra are so much flattened, that it is impossible to give any detail. The articulation surfaces of the centra project beyond their sides and lower surface. The transverse processes are remarkable for their broad attachment to the centrum. In the first vertebrae of the series they are practically attached to the whole length of the centrum, while in the last the attachment is still about two-thirds of this length. The distal three-fifths of the process has parallel sides, but those of the proximal end diverge towards the centrum. The process was apparently supported by lateral ridges. There are indications that the front lateral ridge of the process was in touch, in all the vertebrae of the series, with the praezygapophysis. Haemapophyses are attached to all these vertebrae and still *in situ*.

Measurements from the first vertebra in the series to the last:

Length of centrum	17, 17, 18, 18, 18, 18, 19, 19 mm.
Length of transverse process	18, 19, 18, 15, 15, 15, —, 12 mm.
Length of haemapophyses	40, 37, 31, 31 mm.
Breadth of their distal ends	7, 7, 7, 7 mm.

In front of the first vertebra of the series lies another haemapophysis, which through its position gives the impression of having belonged to the first preceding vertebra. This haemapophysis has a length of 42 mm. Four or five other haemapophyses are scattered about, one of which is perfect. This has a length of 45 mm. The distal end of all these haemapophyses is broad and very thin. The proximal end, distal to the foramen, is narrower and thicker. The foramen of the longest haemapophysis has a height of 7 mm. and a breadth

¹ These numbers refer to the list of literature at the end of the article.

of 5 mm. The articulation surface of this bone has a breadth of 10 mm. The scattered haemapophyses belong to the missing vertebrae between the second caudal and the series of eight. It seems as if the vertebrae in the mass near the end of the series belong to the proximal portion of the tail, but no remarkable features are visible.

SHOULDER GIRDLE.

The scapulae are completely embedded in the rock. The right scapula only shows an indeterminable edge and the left only what are probably its articulation surfaces. One of these surfaces has a more or less triangular contour and this is probably the articulation surface for the humerus. The other is for the contact with the coracoid. Both surfaces are concave and they meet at an obtuse angle.

Both coracoids are present. Half of the left coracoid, however, is hidden by the one of the right side. Both bones only show their lateral surface, and therefore nothing can be made out of their thickness or their marginal surfaces. The contour of the right coracoid is complete. The scapular border of the coracoid is not straight, for slightly above its junction with the glenoidal border it is deeply indented. This indentation has a length of 12 mm. and a maximum depth of 3 mm. Further upwards the contour line bends slightly forwards. The upper border is not well preserved, but seems to be horizontal; it would then make a nearly right angle with the front border. The upper portion of the front border is straight; below the level of the middle of the bone it curves backwards; the lower front border of the bone is straight. The glenoidal border is fairly straight and meets the lower portion of the front border practically at right angles. The surface of this coracoid is fairly flat and one would scarcely take notice of some slight undulations if the left coracoid were not present. The visible portion of that bone is not flat for it shows a rather deep concavity on its outer surface, running from the hinder end of its glenoidal border upwards. The supracoracoidal foramen is situated in this concavity, which continues past this opening. The lower corner of both inner and outer surface of this coracoid bulges outwards. Both peculiarities are also seen in the right coracoid, but in a much less degree. As the bones are now reduced to the thinness of paper, it is not impossible that the described undulations are due to original differences in the thickness of the bone. However, it must be remembered, that the bulge in these coracoids is in practically the same position as the *tuberositas coracobrachialis* described by v. HUENE on the coracoid of *Pachysaurus magnus* (3, p. 149).



Fig. 2. *Aristosaurus erectus*. Right and left coracoid and proximal surface of left scapula. The border behind the supracoracoidal foramen in the left coracoid is not clearly visible. About nat. size.

The upper and front portion of the bone is much thinner than the lower and hinder portion. The greatest height of the right coracoid is 43 mm. and its greatest breadth 32 mm. Both coracoids have a foramen supracoracoideum. It is fairly large and situated close to the middle of the scapular border. Its

diameter is about 3 mm. and the distance from the scapular border is between 2 and 3 mm.

HUMERUS.

Both humeri are present. Their proximal ends are fairly well preserved, but their distal ends are poor. The very broad proximal end is hollow in front and convex behind. Its upper border is convex and its upper-lateral border slightly so. There is no distinct demarcation between the upper end of the processus lateralis and the upper border of the bone. The lateral border of the humerus is strongly concave immediately below the processus lateralis. The medial border of the proximal end is concave throughout. There are indications that the caput humeri was not situated on the extreme medial end of the upper border. The breadth of the proximal end, measured from the lower corner of the processus lateralis to the upper medial end, is 45 mm. in the left and 52 mm. in the right humerus.

The shaft is very narrow; at its narrowest place it measures 9 mm. in the left humerus. All that can be said of the distal end is, that the condyli project forwards and do not make themselves apparent on the hinder surface. The length of the humerus differs considerably in the two specimens. The right humerus measures 93 mm. in length and the left only 80 mm. The length of the left humerus is most probably reduced by crushing, as it stands nearly vertically on the general plane of the remains. The lower end of the processus lateralis lies 53 mm. above the distal end in the left humerus and 58 mm. in the right one.

ULNA AND RADIUS.

There is not much left of these two bones. Only those of the right side have been preserved and these are really nothing more than impressions. The proximal end of the ulna is broad. The line marking its articulation surface is not perpendicular to the axis of the bone, and therefore, what is most probably the hinder portion of this end, is higher than the front portion. The breadth of this end of the impression is 18 mm. (this would in reality be the thickness of the bone). Distally this dimension is gradually reduced towards the middle of the shaft, which has a breadth of 9 mm. Then the breadth increases again towards the distal end, which may have been as broad as the proximal end. The total length of the bone is 64 mm.

The impression of the radius has a proximal breadth of 10 mm. and a distal breadth of 14 mm., while the shaft has a breadth of 8 mm. The total length of the bone is 58 mm. The line marking the proximal end of the impression seems to be concave, so that probably the proximal articulation surface was hollow, at least near the side which made the impression.

CARPUS.

The remains of probably four carpalia are present and still in their original position, but they are so fragmentary that nothing can be said about them.

ILEUM.

Both ilea are present. The left ileum is visible from the medial side. Its contour is complete, but most of the surface of the bone has broken off and portions of the upper part of the bone are only represented by impression. The right ileum is badly preserved. It is visible from the ventral side and its position is more or less vertical to the plane of the remains. Therefore it has suffered greatly from crushing.

The ileum consists of a large plate, which is slightly longitudinally convex as seen from the medial side, and which has a short anterior and a long pos-

terior process, a long and slender preacetabular process and a short, thick postacetabular process. The upper portion of the ileum is very thin, the lower portion is thicker. The upper border is convex. The spina iliaca anterior terminates in a sharp point, while the spina posterior is broad and its end truncated. There is a low ridge on the medial surface of the hinder end of the ileum. This ridge starts behind the middle of the bone and is continued on to the spina posterior. It is situated very near to the lower border of the spina and is practically parallel with it. The hinder border between the spina posterior and the processus postacetabularis is straight. The length of this straight border is 21 mm. The open acetabulum cuts into the ileum to a depth of 17 mm. and a breadth of 41 mm. Above the acetabulum the medial surface of the ileum shows a deep fold, that is to say, here the lower portion of the ileum is bent inwards on the upper portion. This groove corresponds with the crista supraacetabularis on the lateral surface. The medial surface between this groove and the acetabular border is convex. The articulation surface may therefore be concave. Groove and acetabular border are nearest to each other at the root of the processus praeacetabularis. From this point border and

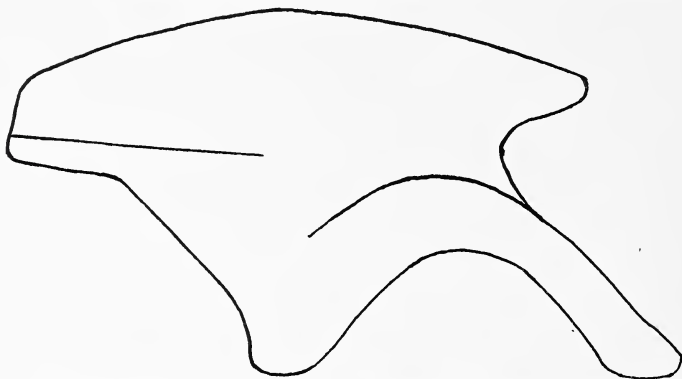


Fig. 3. *Aristosaurus erectus*. Medial view of the left ileum. About nat. size.

groove diverge backwards. From the position of the groove one would conclude that the acetabular surface extends from the crista supraacetabularis inwards and very much downwards and therefore also forms a lateral articulation surface.

The processus praeacetabularis is slightly narrower near its junction with the body of the bone than near its extremity. It reaches much further forwards than the spina anterior. Between the two there is a deep and wide notch. The length of the processus praeacetabularis, measured from the base of this notch, is 36 mm. The distance between the end of the spina iliaca anterior and that of the spina iliaca posterior is 75 mm. The height of the ileum, measured from the lower end of the processus postacetabularis to the upper border, is 46 mm.

PUBIS.

The pubes are beautifully preserved. The right pubis is complete, except for its lateral distal corner, of which, however, the impression is present. The left pubis is broken in two, the proximal half being in one slab and the distal half in the other. There is no indication that the pubes were fused together medially. This does not exclude the possibility that they were actually fused, because of the medial borders of both bones only a very small portion of that of the right pubis is preserved.

The length of the right pubis is 111 mm. Its breadth at the downward fold is 27 mm. The narrowest part of the pubic plate, which is near its distal end, measures 17 mm., while the breadth of the distal end is 20 mm. The lateral border of the pubic plate is thick and its medial border is paper thin. The right pubis does not show the thickening of the distal end, but in the left one it is clearly visible. The whole lateral border of the pubis is concave. The medial border is straight. The upper surface of the pubic plate is concave, at least near its proximal end. The left pubis shows plainly that the lower surface of the pubic plate is convex. The proximal medial corner of the pubic plate is bent downwards and at right angles to the larger portion of the bone. The angle is rounded. The pubic neck continues from the proximal lateral corner of the pubic plate to the articulo ileo-pubica. The narrowest place of the pubic neck has a breadth of 11 mm. in the right pubis and a breadth of 10 mm. in the left one. It is situated at 22 mm. and 18 mm. from the articulo ileo-pubica in the right and left pubis respectively. There is not much twist left in the neck of the right pubis, through the crushing of the bone. Its upper portion, however, still makes a considerable angle with the pubic plate. The medial side of the neck of the left pubis bends down more and more as it approaches the proximal end of the bone. The upper surface of the proximal end finally makes an angle of about 45° with the upper surface of the pubic plate. The upper border of the processus subacetabularis makes an angle of slightly less than 90° with the lateral border of the pubis. The breadth of the pubis across the processus subacetabularis is 25 mm. The height of the processus subacetabularis is much less at its lower than at its upper end. At its lower end the processus subacetabularis is bent hooklike at an angle of about 90° in the direction of the distal end of the bone. The termination of the lower end is not abrupt; the upper border of the processus subacetabularis rounds off gradually into the lower border of the hooklike process.

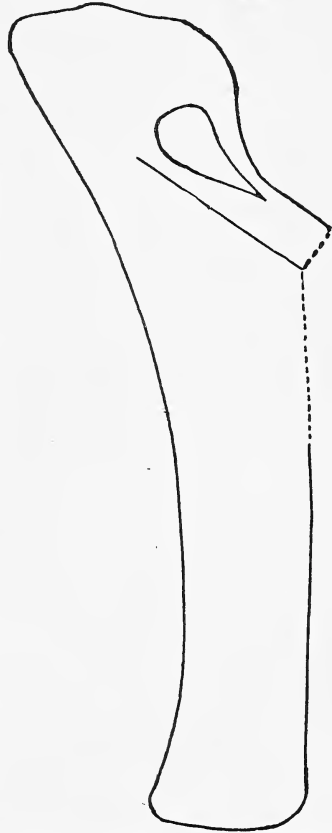


Fig. 4. *Aristosaurus erectus*. Upper anterior view of right pubis. About nat. size.

Continuing distally, this process bends gradually more and more to the medial side, until it unites with the extreme end of the bent down proximal medial corner of the pubic plate. The breadth of this process at its middle is between 2 and 3 mm. Nothing is visible of the upper surfaces of the proximal end of the pubis. The neck of the pubis, the processus subacetabularis, the hooklike process and the proximal end of the pubic plate surround a large pubic foramen. It is situated nearest to the lower border of the proximal end. Its shape differs slightly in the two bones. In both it is elongated, and has a broad upper end. In the right pubis the lower end of the foramen is sharply pointed and the whole foramen pear-shaped; the upper end of this pear lies

between the lower end of the hooklike process and the bent down proximal medial corner of the pubic plate; its broad base lies more proximally, in the direction of the middle of the upper border of the bone. In the left pubis the lower end of the foramen is not so sharply pointed. The greatest breadth of both foramina is 8 mm. In the right pubis this breadth is situated at about 4 mm. from its broad end, whereas in the left pubis this breadth is retained for a distance of 8 mm. from the broad end. The total length of the foramen is 18 and 21 mm. in the left and right pubis respectively.

ISCHIUM.

Both ischia are preserved. Their condition, however, is very poor. Portions of the two bones are in both slabs. The contour of the right ischium is complete.

The length of the bone is 102 mm. The bones are of course flattened, but the right ischium still seems to show that the downward process is straight and that the proximal plate as a whole is slightly bent outwards. The upper anterior edge of the plate is bent out farther than the upper posterior corner or the lower anterior edge of the plate. The proximal plate has a total breadth of 43 mm. Its posterior portion is thicker than its anterior portion. The medial surface of the proximal plate is concave anteriorly; posteriorly the surface is not preserved. The breadth of the process is 13 mm. At the anterior border the process is thin and at the posterior border it is thick. Distally the posterior border is straight; its proximal half is concave, except for a small portion near its upper end, which is convex. As the two bones were separated from each other before fossilisation and both of them are present in their full length, they cannot have been co-ossified at their distal end. The anterior border of the process is fairly straight. Just below the anterior border of the proximal plate it is concave. This point lies 37 mm. below the junction of the posterior with the anterior portion of the upper border. The anterior border of the proximal plate is very slightly convex. Proximally it bends gradually into the anterior portion of the upper border. There is no *processus subacetabularis ischii*. The upper border of the ischium consists of an anterior and posterior portion, which meet each other at an obtuse angle. The posterior portion makes an acute angle with the posterior border of the ischium. It is fairly straight, but at its posterior end it is slightly concave. This concave part corresponds with the articulation surface for the ileum. The anterior portion is straight in its upper part and rounds off into the anterior border of the ischium. The posterior portion of the upper border has a length of

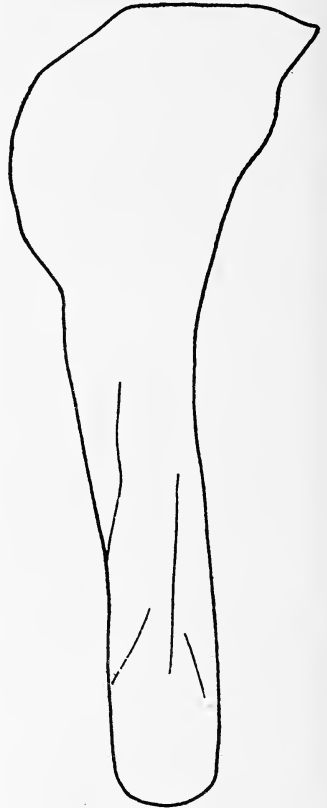


Fig. 5. *Aristosaurus erectus*. Medial view of the right ischium, with impressions of its lateral side. About nat. size.

26 mm. The impression of the lateral side of the bone shows some grooves and the bone must therefore have had fine ridges on this surface, indicated by the lines in fig. 5.

A reconstruction of the pelvis shows a remarkable feature. If the three bones are fitted together with the upper proximal corner of the pubis against the end of the processus praeacetabularis and the upper posterior corner of the ischium (its articulation surface) against the end of the processus postacetabularis, then pubis and ischium can meet in such a way that the lower proximal corner of the pubis rests against the anterior portion of the upper border of the ischium, where the upper border rounds off into the anterior border of the bone. In this position both ischium and pubis would be greatly directed downwards and only slightly forwards and backwards if the line connecting the spinae is placed horizontally. However, the concave upper medial border of the pubis and the convex upper anterior border of the ischium suggest, in the light of the fact, that for example in *Gryponyx africanus* (4, p. 297) pubes and ischia form a complete symphysis right through, that in our case the connection between the two bones may have been greater. In order to find out whether this suggestion lay within the bounds of possibility, models were made in plasticine of the preserved shapes of the bones. As the thickness of the bones would have to be deduced by comparison with completely known bones and as the thickness would not really affect the general argument, these plasticine models were made of uniform thickness. A reconstruction of the pelvis with the help of these models now showed, that if the ilea were placed so, that they diverged forwards and also slightly downwards and the pubes in a plane, it was possible to place the ischia in such a way that their upper anterior border nearly fitted into the concave upper posterior border of the pubes. There would be a complete fit if the lower anterior portion of the proximal plate of the ischium were bent slightly more inwards and the upper posterior corner of the pubis slightly more outwards. The whole fossil has suffered greatly from pressure and both ischia and pubes are lying flat in the slabs. It is therefore nearly certain that they have lost at least some of their original curvature. We may therefore conclude, that in this animal pubes and ischia had very probably a complete suture, from the distal end of the pubes to the distal end of the ischia. The distal ends of both bones would then come still nearer to each other than was already assumed above.

FEMUR.

Both femora are present. The left one shows its hinder aspect, but only an impression of the front side of its distal end. The right femur is seen from the medial side. The bones are badly preserved, for both are more or less split in two and very much flattened.

The length of the left femur is 137 mm. The breadth of the proximal end, measured from the tip of the caput femoris to the lateral end of the proximal surface, is 33 mm. Its thickness as shown in the right femur is 21 mm. The caput femoris projects far inwards. Its height at the medial end is 10 mm. At the extreme medial lower end of the caput there is a very small hooklike, downward process, which may perhaps be interpreted as the section of a rim along its lower border. The line of the proximal surface makes nearly a right angle with the lateral line. There is a slight thickening near the upper edge of the left femur, which may perhaps indicate the position of the trochanter minor. The centre of this thickening is situated at about 13 mm. from the medial end of the caput femoris. The trochanter major is not visible. Al-

though very much damaged, the trochanter quartus is still recognisable. As preserved, the distance of its upper end from the proximal end of the bone is 41 mm. In the perfect specimen this distance may have been 2 or 3 mm. shorter. The trochanter is too much damaged to measure its length. It is situated much closer to the medial than to the lateral side. The lower end of the trochanter is further away from the medial side than the upper end. The fossa intercondyloidea is not visible. The anterior surface of the distal end is slightly concave in the middle. The border of the bone between the anterior surface and the distal surface is also slightly concave. The length (antero-posterior measurement) of what may be the condylus lateralis, measured from the anterior surface to the extreme tip of the condylus, is 33 mm. The section through the distal surface shown by the right femur does not show any obliquity to the axis of the bone; only the posterior end of this line is slightly elevated. The breadth of the distal end is 28 mm. The shaft of the femur has a minimum breadth of 17 mm. in the middle. The minimum thickness of the bone is 16 mm., also in the middle. As seen from behind the femur is straight, but the lateral view of the right femur shows a pronounced sigmoidal shape.

TIBIA.

Both tibiae are preserved, but the surface of the bones is badly damaged. They both show their medial side. The proximal end is very large and the shaft, as seen sideways, is straight. The length of the left tibia (see fig. 6) is 126 mm.; that of the right one 129 mm. The length of the head is 36 mm. in the left and 38 mm. in the right tibia. The line of the proximal surface, which passes from behind upwards and forwards, curves gradually into the line of the anterior surface in the left tibia. In the right one, which is plainly damaged at this point, these two lines meet at an acute angle. Considering both bones, it seems that the tuberositas tibiae did not protrude much. Distally the proximal end becomes rapidly thinner and passes into the shaft. No thickening is visible of the distal end. The medial border of the distal surface is straight and at right angles to the shaft. The thickness of the distal end of both bones is 15 mm. The thickness of the shaft remains practically the same as that of the distal end till past its middle, where the shaft becomes gradually thicker towards the proximal end. The line of the anterior surface of the bone is very slightly concave and the line of the posterior surface is strongly concave in its proximal half.

FIBULA.

Only the right fibula is visible. It is seen from the front, but its whole surface is very much damaged. Its length is 122 mm. The bone is slightly convex outwards. The breadth of the bone in the middle is 7 mm. and at its lower end 17 mm. The proximal end is partly covered by the tibia. The line of the distal surface is at right angles to the line of the lateral surface.

TARSALIA.

The right tarsus is complete and remains of the left one are also present. Of course all the bones are flattened and only show one side.

The astragalus of the right foot has a length of 29 mm. and a breadth of 12 mm. It shows probably its upper surface, but this has only partly been preserved. Its hinder border is thin. The upper surface is divided into three concave portions by two feeble ridges, which start at the front border, about 8 mm. apart and diverge backwards.

That which is still present of the calcaneum is triangular. The edge which is turned towards the astragalus has a length of 10 mm. The front edge has the same length and is slightly concave. The lateral angle seems to be more pointed than the two inner ones.

The distal tarsalia probably also show their upper surface. The cuboid is the largest of the three. Its length is 15 mm. and the breadth of that of the left foot is 10 mm. It has a triangular shape and the line of what may be its hinder surface is convex and forms the longest side of the triangle. In the right foot it turns its sharpest angle outwards, but in the left inwards; however, in the left foot the tarsalia seem to be displaced (see fig. 6). Cuneiforme III and II are both too deep in the matrix to say anything about them with certainty.

FOOT.

Both feet are preserved. All the bones are flattened, although the right foot is slightly better in this respect than the left one. An impression with part of the bone of the left foot is present in both slabs.

Metatarsal I is not visible in the right foot; the left one has a length of 38 mm. and distally a breadth of 14 mm. Its proximal end seems to be narrow. The lateral side of the distal end of the flattened bone is broad and rounded, while its medial side forms an angle at a short distance from the extreme distal end. This corresponds, therefore, with a large rounded lateral head and a small medial one as described by v. HUENE for example in *Plateosaurus Reinigeri* (3, p. 28). As in that species, the axis of the articulation surface for the first phalanx would, therefore, not be at right angles to the axis of the metatarsal, but turned slightly inwards. This is actually the case, for the distal end of the first phalanx stands off inwards.

Metatarsal II has a length of 59 mm. Its proximal end is cut off straight. The lateral side of this end is hollow and forms a sharp ridge with the flat hinder surface. The medial side is not visible, but is probably also hollow to receive the proximal end of metatarsal I, which partly covers it. The length of the hinder border of the proximal surface is about 10 mm. The shaft is straight and has a width of 9 mm. at its narrowest part. The distal end is also cut off straight. It cannot be made out whether the axis of the distal articulation surface was at right angles to the axis of the bone or not. Probably, however, its medial end was slightly higher than its lateral one, for the axis of the first phalanx deviates slightly inwards from the direction of the axis of metatarsal II. The distal end has a breadth of about 15 mm.

Metatarsal III has a length of 66 mm. It is more slender than metatarsal II. Its proximal end has a breadth of 17 mm. and shows on its hinder surface a slight longitudinal ridge, possibly marking the extent to which it covered metatarsal IV. The shaft is straight and measures at its narrowest part 9 mm. Near the distal end the medial side of the shaft is concave and the lateral side convex. The breadth of the distal end is 14 mm. The axis of the distal articulation surface is not at right angles to the axis of the bone, as its medial end is slightly higher than its lateral one.

Metatarsal IV has a length of 60 mm. It is a much more slender bone than metatarsal III. The breadth of its distal end is 12 mm. The distal articulation surface is not at right angles to the axis of the bone. Its lateral end is higher than its medial end. It rounds off gradually into the lateral side of the bone. The impression of its dorsal surface shows a broken off knob of matrix, which entered into the lateral collateral pit.

Metatarsal V has a length of 30 mm. Its proximal end is broad and its

distal end a blunt point. The proximal end has a breadth of more than 13 mm. Laterally on the front surface there is a ridge which runs towards the distal end.

All phalanges are represented.

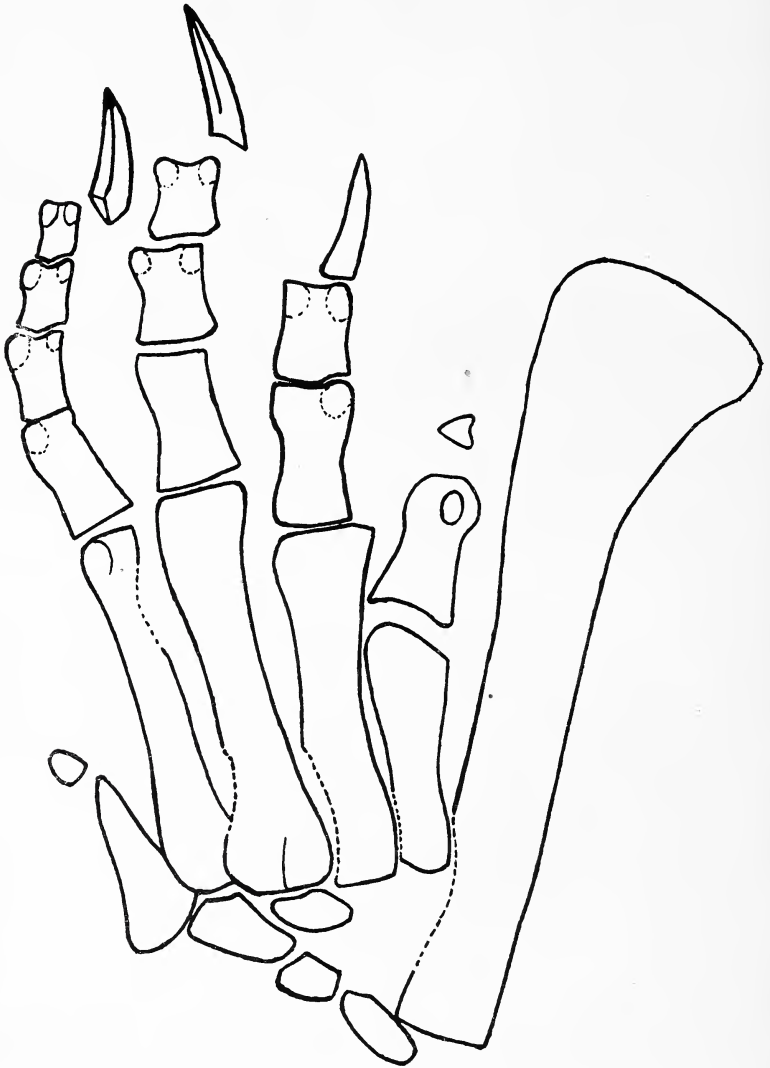


Fig. 6. *Avistosaurus erectus*. Left foot seen from above. The first phalanx of the first digit shows its medial collateral pit; the other phalanges show the impressions of the deepened sides of their distal ends. Slightly reduced.

I, 1 lies flat down on the slab, but shows its complete medial collateral pit and nothing of its lateral one. It may therefore be concluded that the distal end of the phalanx is turned slightly outwards. The claws are only slightly curved. The second toe deviates slightly inwards and the fourth slightly outwards from the third.

Measurements of the phalanges in millimetres:

		length	prox. breadth	dist. breadth
1st digit	1st phalanx	23	14	—
	2nd "	30	—	—
2nd "	1st "	24	14	14
	2nd "	22	12	10
	3rd "	at least 26		
3rd "	1st "	24	15	13
	2nd "	17	13	12
	3rd "	15	10	10
	4th "	at least 28		
4th "	1st "	22	—	—
	2nd "	13	—	10
	3rd "	11	—	8
	4th "	10	—	—
	5th "	at least 23		
5th "	1st "	7	—	—

DISCUSSION.

The nearest relations of our form are amongst the *Plateosauridae* and *Anchisauridae*, and it is clear that it belongs to either the one or the other. The *Plateosauridae* are all medium sized to large *Dinosaurs* with fifteen dorsal vertebrae, whereas our form is small and has most probably fourteen dorsal vertebrae, agreeing in this respect with the *Anchisauridae*. There is further agreement with the *Anchisauridae* in the relation of the lower arm to the humerus; radius and ulna are longer than half the humerus. The length of the shaft of the humerus stands to the length of the whole humerus as 58 : 93 or 0.62. This relation brings our form in close proximity of *Thecodontosaurus antiquus*. Taking all these facts into consideration it seems clear that our form is an *Anchisaurid*.

Comparison with *Anchisaurus* shows that the dorsal vertebrae are comparatively longer, and that the pubes of the two forms differ greatly. *Massospondylus* is a much larger form. The distal ends of its ischia are coalesced, and each is more or less triangular in section. In our form the distal ends of the ischia are flattened through pressure, but it is difficult to accept that their section was originally triangular. Moreover, they are not coalesced. The relations of the ileum of *Massospondylus carinatus* (2, Pl. XV) are different from those in our form, for it is longer than the latter with regard to its shortest height above the acetabulum. Relatively the dorsal vertebrae of our form are longer than those of *Massospondylus carinatus*. The relation of the lengths of the metatarsals in *Massospondylus Harriesi* (4, p. 303) is different from that in our form. In *Massospondylus Harriesi* metatarsal II is longer than metatarsal IV, whereas in our form metatarsal II is shorter than metatarsal IV.

In comparing with *Ammosaurus* (3, p. 304) and *Gyposaurus* (1 and 4, p. 293) I need only refer to the great difference in the ilea.

The only other genus of the family is *Thecodontosaurus*. Superficially there is great resemblance between our form and the known species of *Thecodontosaurus*. A closer study, however, reveals remarkable differences.

A comparison of the ileum of our form with that of *Thecodontosaurus antiquus* (3, Pls. LXXXII and LXXXIV) shows that in the latter the spina posterior is much more produced. The acetabulum cuts deeper into the ileum of our form, which resembles the *Plateosauridae* in this respect. The highest point of the acetabular concavity is situated much nearer towards the middle of the bone than in our form, and this is another point of resemblance with the *Plateosauridae*. The ileum of our form is manifestly different from that of *Thecodontosaurus cylindrodon* (3, Pl. LXXXIV), and also in the direction of the *Plateosauridae*.

The pubis of our form differs considerably from that of *Thecodontosaurus antiquus* (3, Pl. LXXXV), as far as the latter is known. In our form the lateral edge of the pubis is regularly concave, whereas in *Thecodontosaurus antiquus* its upper end is sigmoidal. There is also great difference in the shape of the pubic foramina. The shape of the proximal end of the ischium of *Thecodontosaurus antiquus*, as far as preserved (3, p. 209, fig. 228), is quite different from that of our form, a difference which is best understood from a comparison of the figures.

Another difference becomes conspicuous when the length of the humerus is expressed in lengths of dorsal vertebrae. Taking one of the hinder vertebrae v. HUENE came to the following results (3, p. 309): In *Thecodontosaurus antiquus* the humerus is about five times as long as the vertebra, and in *Thecodontosaurus skirtopodus* about four and a half times. In our form the length of the eleventh dorsal vertebra is 29 mm. The length of the right humerus is 93 mm., which means that the humerus is only 3.2 times as long as the vertebra. Therefore, the humerus of our form is relatively much shorter than that of *Thecodontosaurus antiquus* and of *Thecodontosaurus skirtopodus*.

There is great difference between the ischium of *Thecodontosaurus minor* (5, p. 469) and that of our form.

The points of difference enumerated above show sufficiently that our form does not belong to any of the known genera of the *Anchisauridae*. It, therefore, represents a new genus, for which I propose the name *Aristosaurus* n.g. with the species *Aristosaurus erectus* n. sp.

Aristosaurus erectus is much more highly specialised than *Thecodontosaurus*, *Ammosaurus*, *Anchisaurus* and even than *Massospondylus*. The build of the pelvis, and especially the position of the ischium, shows adaptation to a usually bipedal mode of locomotion. The same may be concluded from the far forward position of the acetabular concavity in the ileum. The position of the trochanter quartus seems to be very low down on the femur. Its upper end is 41 mm. from the proximal end of the bone. The length of the trochanter is at least 18 mm. Therefore the lower end of the trochanter is situated at more than 59 mm. from the proximal end of the bone, which means very near to the middle of the femur. However, conclusions may not be drawn from this fact, because exact measurements cannot be obtained.

The humerus is much shorter in relation to the body than in the other *Anchisauridae*. The anterior extremity is also relatively much shorter in relation to the posterior one than in all other *Anchisauridae* excepting *Anchisaurus solus*. As in the *Plateosauridae* the tibia of *Aristosaurus* is much longer than the humerus. This is also the case in *Anchisaurus solus*. In the other *Anchisauridae* it is the reverse. All this tends to show that *Aristosaurus* is an *Anchisaurid*, highly specialised in the direction of the *Plateosauridae*, and of the bipedal mode of locomotion.

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Aristosaurus erectus.

Slab on which the animal lies with its ventral side downwards. This therefore gives a dorsal view of the animal. 0.193 × nat. size.





Aristosaurus erectus.

The covering slab of the one in Pl. IX. This gives a ventral view of the animal and the right side of the plate corresponds therefore with the left side of the animal. 0.214 × nat. size.



CONTRIBUTIONS TO THE KNOWLEDGE OF THE REPTILES OF THE KARROO FORMATION

By DR E. C. N. VAN HOEPEN, M.I.

6. FURTHER DINOSAURIAN MATERIAL IN THE TRANSVAAL MUSEUM.

With 13 plates and 27 text-figures.

Eucnemesaurus fortis n.g. et sp.

The remains to be described under this name were collected by myself from a red mudstone, probably belonging to the Red Beds, on the farm Zonderhout, near the railway station of Slabberts. High above the locality is a krans of, probably, Cave Sandstone. The remains consist of the proximal half of a femur, a complete tibia, a proximal portion of a pubis, portions of dorsal and caudal vertebrae and some fragments.

DORSAL VERTEBRAE.

There are portions of three dorsal vertebrae. One centrum belonging to the region between the tenth and the fourteenth, a portion of a neural arch, which belongs to one of the vertebrae from the seventh backwards, and a neural arch which probably belongs to the sixth vertebra.

The neural arch of the sixth vertebra is very much weathered. The anterior supporting ridge is narrow and in its turn supported by a smaller ridge, which starts near its upper end, runs downwards and nearly parallel to the posterior supporting ridge and disappears before reaching the centro-neural suture. There are deep cavities on both sides of this ridge. The sutural surface of the centro-neural suture shows a transverse groove in the middle. The breadth of the neural canal is 1.5 cm. posteriorly and 2 cm. anteriorly. Its height above the sutural surface is 2.5 cm.

In the other neural arch there is probably only one supporting ridge for the processus transversus. It is too fragmentary to merit detailed description. The centrum (Pl. XII, figs. 3 and 4) is large. Its length is about 10.5 cm. It has suffered from pressure, for one side is longer than the other and its lower surface shows signs of compression. The height of its anterior and posterior articulation surface is 11.5 cm. The breadth of the anterior surface is 12 cm. and of the posterior surface it may have been 13 cm., but this cannot be measured, because the right border of the posterior end is broken off. The posterior articulation surface is more concave than the anterior one. There is a deep longitudinal groove on both sides of the centrum and above its middle. There is a large knob on the upper anterior corner of the side of the centrum; this is a portion of the anterior supporting ridge of the processus transversus. The thickness of this knob suggests that this vertebra may be the thirteenth or the fourteenth. The articulation surfaces of the centro-neural suture are broad. A ridge runs transversely across their middle. The breadth of these surfaces in the middle is 3 cm. The neural canal is very deep in the middle of the vertebra. The bottom of the deepest part is divided in two by a ridge. The breadth of the neural canal in the middle is 1.3 cm. Its depth below the centro-neural sutural surface is 3 cm.

CAUDAL VERTEBRAE.

Remains of four caudal vertebrae are present (Pl. XIII, fig. 1). One of these is apparently the greater part of the fourth caudal. Its distal articulation surface is broken off. The concave anterior articulation surface has a height of 9 cm. and a breadth of 8.5 cm. Its lower border is much thicker and broader than the sides; this is for articulation of the haemapophysis. The centrum is thickest immediately below the transverse processes, where it measures 5 cm. The sides converge downwards, and as far as can be made out, the lower surface is rounded. If the anterior articulation surface is placed vertically, the upper surfaces of the broken off transverse processes slope backwards and downwards. The praezygapophyses are broken off. The anterior edge of the processus spinosus starts somewhat in front of the middle of the bone and slopes upwards and backwards. This front edge is concave. The section of the base of the process is wedge-shaped. The base of the transverse process is very broad. It starts at about 3 cm. from the anterior edge of the centrum. Its thickness on the left side is 1.8 cm.

Two others are from the middle caudal region and perhaps from the twelfth to the sixteenth. The posterior one of the two has lost its anterior half and its dorsal spine. Its concave posterior articulation surface has a height of 6 cm. and a breadth of 5.5 cm. The hinder border of the left transverse process lies 2 cm. in front of the hinder border of the centrum. The anterior one of the two has lost a piece of its anterior articulation surface. The length of its centrum is 7.8 cm. above and 6.2 cm. below. The anterior articulation surface is more concave than the posterior one, but this may be due to the developing, because there was scarcely any difference between the bone and its incrustation. The transverse process is attached about 0.5 cm. in front of the posterior border of the centrum. The height of the anterior articulation surface is 6 cm. The height of the posterior surface is slightly less and its breadth 5.3 cm.

The fourth vertebra belongs to the end of the middle caudal region. It is too much weathered to give any detail. The length of the centrum was at least 6 cm. and its height at least 3.5 cm. There is a transverse process which has a proximal breadth of 2 cm. The processus spinosus stands on the distal half of the bone.

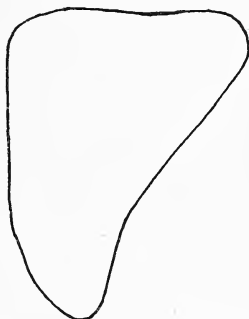
PUBIS.

Two pieces of the left pubis are preserved, the distal and the proximal end. The proximal end (Pl. XI, figs. 3 and 4, and text-fig. 1) consists of the neck with the processus subacetabularis. The distal end of the piece still belongs to the pubic plate. The inner side of this end is bent down. The section at the distal fracture is a flat oval, the inner end of which is elongated and ultimately broken off. The neck gives the impression of being peculiarly short. Its section differs greatly from that of the pubic neck of *Dromicosaurus gracilis* described hereafter. Through lack of material and literature it could not be made out whether this difference is of family value. There is no demarcation between an anterior and a medial surface of the neck. A section shows a regularly convex line from the medial border of the neck over the medial and anterior surfaces to its lateral border. The neck has a distinct lateral surface, which broadens rapidly into the lateral surface of the proximal end, and which narrows down rapidly into the lateral border of the plate. This lateral surface of the neck rounds off broadly into the hinder surface, which is concave in all directions. The greatest breadth of the neck, from the inner to the lateral border, is 6 cm., while its greatest thickness, measured at the upper fracture (see Pl. XI), is 3 cm. The inner portion of the neck is thin and bent backwards.

The lateral border of the neck is slightly concave forwards. This border broadens out proximally into the broadly rounded upper anterior corner of the bone. The medial surface of the upper end is convex antero-posteriorly, but concave from above downwards. Its lateral surface is concave. The articulo ileo-pubica is broad and slightly twisted. The upper anterior portion



Text-fig. 1. Outline of transverse section through left pubic neck of *Eucnemesaurus fortis* in the region of the proximal fracture (Pl. XI). Seen from the distal end. The anterior border is above and the medial border on the left-hand side. Nat. size. The slight concavity in the lower border deepens rapidly towards the distal end.



Text-fig. 2. Outline of transverse section through left pubic neck of *Dromicosaurus gracilis* near the upper end of the foramen obturatorium. Seen from the distal end. The anterior border is above and the medial border on the left-hand side. Nat. size.

of the lateral border of the proximal surface is higher than that of the medial border, while the lower posterior portion of the lateral border, just before reaching the groove, is lower than the corresponding medial border. The processus subacetabularis is broken off through the groove on the proximal surface. This groove has a depth of 1.5 cm. and does not reach the medial border. The medial border of the proximal surface is evenly convex, while the lateral border is slightly concave. One gets the impression from the proximal end that its posterior portion is slightly twisted to the lateral side. The fractured end of the processus subacetabularis shows a convex lateral and a slightly concave medial border. Taken generally, the section at this end is triangular.

The distal end (text-figs. 3 and 4) is very much weathered. A portion of the rounded lateral side is still visible. Its breadth as preserved is proximally 9 cm. and distally 7.5 cm. Its thickness is 3.5 cm. The greatest breadth of the distal surface as preserved is 4.5 cm. The medial-hinder-lateral border of the distal surface forms practically half a circle. Its front border is straight. The distal surface makes an acute angle with the anterior surface. I wish to lay stress on the fact that the anterior surface is the only one which is not weathered.

FEMUR.

Only the proximal half of the left femur is preserved (Pl. XII, fig. 1 and text-fig. 5). The piece is broken off through the trochanter quartus. The

length of the bone as preserved is 26.5 cm. The breadth of the proximal end, measured from the medial end of the caput femoris to the lateral side, is 15.5 cm. Its maximum thickness, measured medially to the trochanter minor, is 9 cm. The caput femoris is directed inwards; it has a breadth of 8.5 cm. and a height of 8.5 cm. The proximal surface is convex, rough and pitted, and forms an angle with the lateral side. The trochanter minor lies on the hinder surface and very near to the border of the proximal surface. It is a thick broad boss, the middle of which is situated at 8.5 cm. from the medial end of the caput femoris and at 6.5 cm. from the lateral side of the bone; in this therefore it differs from the trochanter minor of most *Plateosauridae*, which is there situated much nearer to the medial than to the lateral side. The height of the trochanter minor is 1 cm., its length is about 6 cm. and its breadth about 5 cm.



Text-fig. 3. *Eucnemesaurus fortis*.
Outline of distal surface of left pubis. The anterior border is below, the lateral border to the left. $\times \frac{1}{2}$.

The upper end of the trochanter major is situated at a distance of 12 cm. from the proximal end of the bone. The ridge of the trochanter is worn away, but it is still plainly visible that its lateral side formed a deep, broad groove with the general surface of the bone. The height of the trochanter near its proximal end as preserved is 2.5 cm.; it may originally have been 1 cm. higher. The length of the trochanter is about 10 cm. The femur is broader and thinner between its proximal end and the trochanter major than further downwards. A broad thick ridge runs from the trochanter major downwards apparently in the direction of the condylus medialis. This ridge continues upwards from the trochanter, but diminishes gradually in height and loses itself at about midway between the trochanter and the proximal end of the bone. The ridge is concave on its medial side opposite the trochanter major. The trochanter does not lie on the top of the ridge, but is situated on its lateral side. The medial side of the anterior surface of the bone is concave as far as preserved. The lateral side of the anterior surface, below the trochanter major, is convex. The medial side of the proximal end of the bone is concave, while its lateral side is slightly convex. Therefore, the upper end of the bone is turned slightly inwards. The hinder surface of the proximal end was originally flat; now it is irregularly concave through pressure. Opposite the trochanter quartus it rounds off, over the lateral side, into the anterior surface. Higher up, the lateral side is flatter and its borders with the anterior and posterior surfaces are more conspicuous.

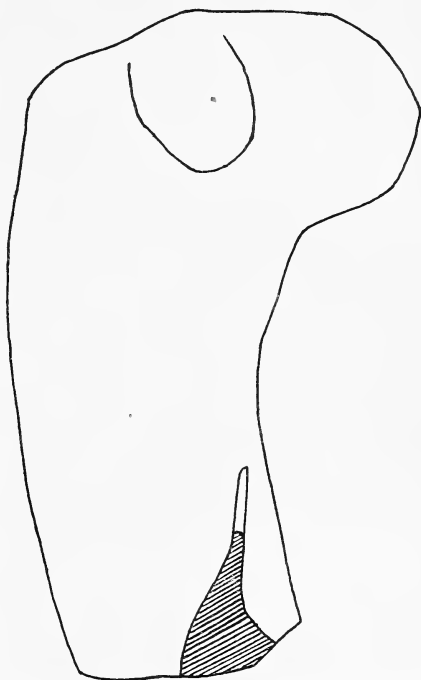


Text-fig. 4. *Eucnemesaurus fortis*.
Outline of longitudinal section of distal end of left pubis. Distal border to the right, anterior border below. $\times \frac{1}{2}$.

The trochanter quartus begins at a distance of 17.5 cm. from the proximal end of the bone. Only a small portion of the trochanter is present; the lower half of the trochanter and the whole of its upper edge are lost. The portion preserved has a maximum height of 4 cm. Its breadth at the base, just above the fracture, is about 5.5 cm. The medial side of the trochanter is concave and the lateral side convex. Nothing is visible of a second upper ridge, but this may be due to crushing. The trochanter is situated nearer to the medial than to the lateral side of the bone. The breadth of the diaphysis over the

trochanter is 9 cm. Its thickness, measured from the top of the upper end of the trochanter quartus as preserved to the top of the ridge on the anterior surface, is 12 cm.

The section of the bone, which is revealed at the fractured end, is remarkable. The fractured surface has been polished and its photograph is given in fig. 2 of Pl. XII. It shows a thick wall of substantia compacta which is clearly lamellar. Sharply defined from this is an inner mass of substantia spongiosa. Only a small portion of the whole section is not occupied by bony matter. Here we have, therefore, a *Theropod* femur of practically solid structure. ZITTEL in his "Handbuch" (1) states on p. 718 that the limb-bones of all *Theropoda* are hollow and were perhaps filled with air. In EASTMAN'S Text-book it is stated in the diagnosis of the Sub-Order *Theropoda* (3, p. 227) that the limb-bones are hollow. v. HUENE, in his great work "Die Dinosaurier der europäischen Triasformation," compares the *Theropoda* with the *Sauropoda* on p. 346, and says: "The limb-bones of the *Sauropoda* are not tube-like, but nearly completely massive, whereas those of the *Theropoda* are hollow." In the second edition of ZITTEL'S handbook in 1911, BROILI states in the diagnosis of the Sub-Order *Theropoda* that the limb-bones are mostly tube-like. Probably, therefore, BROILI knew of *Theropod* limb-bones which were not hollow, and our femur now adds to the evidence.

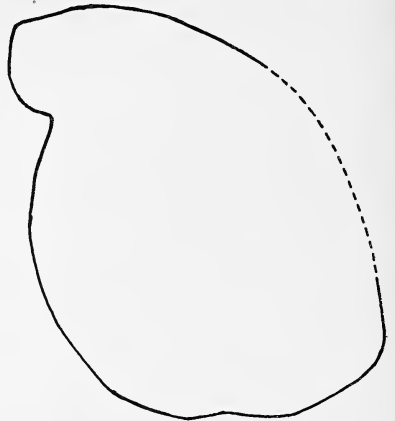


Text-fig. 5. *Eucnemesaurus fortis*. Outline of the posterior view of the proximal end of the left femur, showing the position of the trochanter minor and the upper end of the trochanter quartus.
× $\frac{1}{3}$.

TIBIA.

The left tibia (Pl. XI, figs. 1 and 2, and text-figs. 6 and 7) is complete. It has a very large proximal articulation surface and a straight shaft. The bone was found in five pieces, which all fitted neatly together. The total length of the bone is 46 cm. The head of the tibia has a length of 19.5 cm., measured from the hinder end of the medial condylus to the anterior edge of the tuberositas tibiae. Its greatest breadth, transverse to this greatest length, is 13.5 cm. The length of the lateral side of the head is about 15 cm. Anteriorly the head of the tibia has a laterally directed process, the tuberositas tibiae. The lateral border of the proximal articulation surface is slightly convex at the tuberositas, more convex around the lateral condylus and sharply concave in between. The medial border runs from the tuberositas tibiae inwards and curves gradually backwards; the posterior part of this border is not so convex as the anterior portion. The posterior border is convex behind each condylus and notched in the middle; this notch is still filled with matrix.

The proximal articulation surface is roughly convex, with small concavities in its anterior portion. The lateral posterior side of the surface is lower than the medial posterior corner and this again is slightly lower than the anterior end. The hinder border is overhanging. The shape of the proximal articulation surface is given in text-fig. 6. The shaft narrows down quickly immediately below the head. The distal end is transversely broad. The medial one-third of the distal articulation surface is more or less flat and slopes very slightly from its anterior edge backwards and downwards. The anterior part of this surface is convex. The lateral part of the distal articulation surface consists of an anterior and a posterior portion. The anterior portion, which is the distal surface of the processus tibiae anterior distalis, occupies a much higher position than the posterior portion, which is the distal surface of the processus tibiae posterior distalis. The distal surface of the processus posterior



Text-fig. 6. *Eucnemesaurus fortis*. Left tibia. Outline of proximal articulation surface seen from above. Lateral side to the left. $\times \frac{1}{3}$.

is continuous with the medial portion of the articulation surface. It slopes upwards from the lateral to the medial side and from the anterior towards the posterior border. As the processus posterior is rather weathered, especially laterally, the last fact might be due to this cause. If it is original, it would be a marked difference with the tibia of *Dromicosaurus gracilis*, where the surface slopes upwards from the posterior towards the anterior border. The medial end of the distal surface of the processus anterior slopes down gradually towards the medial portion of the articulation surface, with which it joins up by means of a broadly convex ridge. The distal face of the processus anterior slopes from



Text-fig. 7. *Eucnemesaurus fortis*. Left tibia. Outline of distal articulation surface seen from below. Lateral side to the left. $\times \frac{1}{3}$.

its medial end upwards and outwards and from its anterior border backwards and slightly upwards. Medially the processus posterior is slightly broader than the processus anterior. It is bluntly pointed towards the lateral side. Laterally it is bent very slightly forwards. Both ends of the distal surface of the processus anterior are broad, but the inner end is slightly broader. The lateral end of the processus does not project further outwards than the processus posterior. The highest point of the lower surface of the processus anterior is situated 46 mm. above the lowest part of the processus posterior. The sulcus malleoli tibiae is very deep. This sulcus begins rather far above the processi and passes down between them towards the hinder border of the processus anterior. The greatest breadth of the distal end, parallel to the front border, is 14.5 cm. The front border is laterally slightly concave and medially convex. The medial border makes an acute angle with the anterior border and an obtuse angle with the posterior border. The anterior medial corner is globose;

its medial and anterior sides are slightly overhanging. The medial border rounds off into the posterior one. The greatest breadth of the medial side is 11 cm. The posterior border converges slightly with the anterior border towards the lateral side; its length is 10 cm. The distance from the anterior medial corner of the distal end to the lateral end of the processus posterior is nearly 16 cm.

A broad high ridge runs down from the tuberositas tibiae in the direction of the anterior medial corner of the distal end, but disappears in the lower half of the bone. The lateral anterior edge of the distal end is broadly rounded below. Higher up the edge becomes a fairly sharp ridge, which disappears above the middle of the bone. There is a broad low boss on the lateral side of the bone, below the notch in the lateral border of the proximal surface. Its highest point lies about 8.5 cm. below the notch. The surface of the bone being generally crushed, no further particulars can be given. The thickness of the bone in the middle is 7 cm. and its breadth at this place 5.5 cm. Both dimensions were originally somewhat larger. The thickness of the distal end is slightly more than 9.5 cm. At the middle fracture the bone shows a thick wall of substantia compacta but no substantia spongiosa. The central cavity is fairly large.

There are three fragments of the same specimen which could not be identified with certainty. One of these is probably a piece of the shaft of a femur. Another piece might be identifiable if better material were present for comparison. The third piece is an end of a large bone. The surface at the end has a length of 17.5 cm. and a breadth of 11 cm. At one end the sides of this surface meet at an acute angle; at the other end its border is broadly rounded. The shaft becomes rapidly narrower and at a distance of 10 cm. from the end its breadth is 8.5 cm. Its thickness at this point may be about 5 cm. The only bones it could belong to are the ischia and the fibulae. For the distal end of the ischium it is far too large, but for the distal end of the fibula it also seems too large. Its shape is exactly what one would expect of the distal end of the fibula.

Two other bones were found in the same locality, which belong to a much larger animal. One is a fragment of a tibia and the other of a coracoid. The tibial fragment was found loose on the same spot as the remains described above. It has probably broken away from higher strata. The coracoid was found loose on a very much higher level and was probably originally in the same conglomeratic bank as the tibial fragment.

The fragment of the tibia is the lateral portion of the head of the right bone. It has a length of 22 cm. corresponding with about 13 cm. in the tibia of *Eucnemesaurus*. In comparison with the head of the *Eucnemesaurus* tibia the head under discussion may have had a total length of 33 cm.

The coracoid consists only of the foramen supracoracoideum with some bone substance around it. It is apparently a right coracoid. The foramen passes upwards and inwards. Its outer opening is oval shaped, having a width of 3.5 cm. and a height of 2.8 cm. The inner surface below and behind the foramen is concave, the outer surface convex. The thickness of the bone immediately behind the foramen is 3 cm. It becomes thinner towards the scapular border. Immediately in front of the foramen the bone has a thickness of 6.5 cm. Both these bones indicate *Theropodous Dinosaurs* of tremendous size.

DISCUSSION.

The described remains of the smaller animal show *Plateosaurid* characters, and especially is the tibia so typically *Plateosaurid* that I do not hesitate in

placing the described form in that family. It will, however, be necessary to compare it with the different forms grouped together under this name and with those without fixed position; perhaps also with some *Anchisaurid*.

The South African *Plateosaurid Euskelesaurus* is known by some fragmentary remains. Only a few of the bones can be used in comparison and among these the femur is the most important. Now the femur of *Euskelesaurus Brownei* is incomplete, both ends being broken off and only the diaphysis with the trochanter major and trochanter quartus being present. Comparison is therefore rather difficult.

In *Euskelesaurus Brownei* the trochanter major lies 15 cm. below the present proximal end of the femur. From the figure given by v. HUENE (4, p. 30) it is manifest that the upper end of the trochanter quartus lies from 26 cm. to 28 cm. below the proximal end of the bone. In our form the distances of trochanter major and trochanter quartus from the proximal end are 12 cm. and 17.5 cm. respectively. From these measurements can easily be deduced that in *Euskelesaurus Brownei* the trochanter quartus lies relatively lower than in our form. Of course the relation will change if the missing portion of the head is added. Now one cannot say exactly how much of the head is missing, but let us for one moment suppose that the relations were the same in both bones. To get the same relations as in our form, 9 cm. would have to be added to the proximal end of the femur of *Euskelesaurus Brownei*. The distance of both trochanters from the proximal end would then be 24 cm. and 35 cm. respectively; these distances would therefore be twice the same distances in our form. v. HUENE estimates that not much more than 5 cm. is missing from both ends together, and 9 cm. is therefore far above his estimate. The distal end of the *Euskelesaurus* femur is missing and if some 10 cm. are added for the missing part the whole bone would then have a length of $9 + 65 + 10 = 84$ cm. According to the above relations our femur would have to be half the size of the *Euskelesaurus* bone and therefore have a length of at the most 42 cm. That is at least 4 cm. shorter than the tibia! On the other hand the lower end of the trochanter quartus in our form was situated at least 28 cm. from the proximal surface. This distance can certainly have been greater. In *Euskelesaurus Brownei* the lower end of the trochanter quartus lies about 40 cm. below the present proximal end, and if 9 cm. are added to this end, the distance of the trochanter quartus from it will be 49 cm. To get comparable results the same length as above must be maintained, viz. 84 cm. The lower end of the femur will therefore measure 35 cm. If the same relations existed in the two bones, the length of the portion of our femur below the lower end of the trochanter quartus would be $28 \times 35 : 49$ or 20 cm. The total length of our femur would then be at least 48 cm. Only one thing can follow from these different results for the length of our femur and that is, that our premise of the same relations in the two bones is wrong. The conclusion that the trochanter quartus of *Euskelesaurus Brownei* lies relatively lower than the one of our form is right.

The sections through and near the pubic neck of *Euskelesaurus Brownei* (4, p. 29) are quite different from those of our form. There are ridges on the lower surface of the neck, which are absent in our form. The shape of the proximal surface of the pubis is also different. The head of the tibia of *Euskelesaurus Brownei* has a greater lateral concavity. There seems also to be great difference in the distal end, but the figures given by v. HUENE are not quite clear. According to the text (4, p. 32) the posterior border of the distal end of the tibia in *Euskelesaurus Brownei* is much longer than the anterior border. In our form this is just the reverse. v. HUENE mentions that the type of

tibia of *Euskelesaurus Browni* also occurs in *Gresslyosaurus robustus* of Bebenhausen near Tübingen. The distal end of the tibia of *Gresslyosaurus robustus* is figured and described on pp. 134 and 135 of v. HUENE's great work on European *Dinosaurs* (5). In the explanation of fig. 133 it is stated that the lower border of the figure corresponds with the anterior border of the distal end; this lower border, however, is much longer than the upper border, which would then correspond with the posterior border of the distal end. According to this figure, therefore, the anterior border of the distal end would be longer than the posterior border, as in all other Triassic *Theropoda*. Again, the explanation of fig. 134 states that the figure gives a postero-lateral view of the same distal end. From this figure it is apparent that the lateral end of the processus anterior is higher than that of the processus posterior and that both these processes correspond with the anterior and posterior border respectively of fig. 133. Now, if one compares the plate figure of this distal end on Pl. LIV, which is given in front view, with the text-figures, it will be found that the processus anterior is identical with the processus anterior of the text-figures, further that the processus posterior projects further downwards than the processus anterior and that the whole posterior breadth of the bone is hidden behind the anterior breadth. The three figures are therefore identical among themselves and they show the same build of the distal end of the tibia as in all other Triassic *Theropoda*. The description in the text, however, is quite different. It is stated, that the posterior medial angle of the distal end is acute and projects further to the medial side than the anterior angle; in the figure, however, the posterior medial angle is obtuse, while the anterior one is acute and projects further to the medial side. It is also stated in the text that the hinder convex border has a length of 15.5 cm. However, the convexity and the dimension correspond with the anterior border of the figures. As the figures correspond with the general build of the distal end of the tibia in *Theropodous Dinosaurs*, I can only conclude that some mistake must have entered into the description.

A comparison with *Gryponyx africanus* as described by BROOM (7) is very difficult. It is of the greatest importance to compare the proximal end of the pubis of our form with that of *Gryponyx*, especially with regard to the shape of the neck, but from the description it is quite impossible to do so, for Dr BROOM only states that "The upper end of the pubis is large and fairly flat," and "It has a large nearly round pubic foramen." Mr S. H. HAUGHTON of Cape Town, however, has very kindly furnished me with the necessary information. It appears that the pubic neck of *Gryponyx africanus* is very broad and flat, being nearly three times as broad as thick. Another very desirable comparison is that of the tibiae. The tibia of our form is typically *Plateosaurid*. This is especially shown by the shape of the head. Dr BROOM describes the tibia of *Gryponyx africanus* as follows: "The tibia has a larger head than appears to be the case in *Plateosaurus*, but otherwise presents no special interesting features. The total length of the bone is 447 mm. and the proximal end measures 163 mm. by 71 mm." That is all. Nothing about the shape of the proximal nor of the distal end. Only a few measurements to work with. It appears that our tibia is 1.3 cm. longer. Its head however is 3 cm. longer and 6 cm. broader. Therefore the tibia of our form has a very much larger head than that of *Gryponyx africanus*. A figure of the tibia of *Gryponyx africanus* has been given (7, Pl. XIV, fig. 4) and in the explanation this is called an "outer view of left tibia." In an outer view the sulcus malleoli should be visible. It is, however, not shown in the figure. It would be remarkable if this tibia did not possess such a sulcus. There is, however, no

reason whatever to accept such a condition, for the figure is not an outer view of the left tibia, but an inner view of the right one. The following points will demonstrate this conclusion: A lateral view would not only show the sulcus malleoli but also the proximal articulation surface, because the latero-posterior corner is the lowest part of the head of the tibia in *Plateosauridae* and *Anchisauridae*. Neither of these two are visible in the figure. The border between the side figured and the distal surface is horizontal, as is the case with the medial border of the distal end of the tibia in all Triassic *Theropods*. In the figure the anterior border of the distal end passes from the anterior end of this horizontal border upwards and forwards (the anterior border of the proximal end is on the left-hand side). In an outer view of the left tibia, in which the anterior surface of the bone is visible, the anterior border of the distal surface would pass from the left end of the horizontal medial border upwards and backwards. An inner view of the left tibia and an outer view of the right one would have their anterior surface on the right-hand side. Dr BROOM does not give the distances of the trochanters from the proximal end of the femur. Taken from the figure, the upper end of the trochanter major lies at a distance of 10 cm., and the upper end of the trochanter quartus at a distance of 18 cm. from the proximal end of the bone. In our femur, therefore, the trochanter major is situated relatively lower than in *Gryponyx africanus*.

A comparison with *Plateosaurus stormbergensis* BROOM (9, p. 162) is practically impossible from the "description." Dr BROOM mentions three bones, the metacarpale, the femur and the pubis. Of the femur the length, the breadth of the distal end and the distance from the proximal end to the top of the median trochanter are given as principal measurements. Essentially the description of this bone consists of the statement that it agrees very closely with the femora of existing species of *Plateosaurus*. The existence of this close agreement is greatly appreciated, so much so, that one develops an irresistible wish to know exactly how this femur differs from those described before. However, to arrive at this knowledge, it is necessary to have among others another principal measurement, the distance of the trochanter major from the proximal end, which Dr BROOM does not give. I conclude, from the figure of the femur of *Plateosaurus stormbergensis* (9, p. 164), that the proximal end of the femur in our form is more massive than in the type from the Stormberg.

The head of the tibia of our form is relatively much broader than that of *Massospondylus Harriesi*.

A comparison of the tibia of our form with that of the European *Plateosauridae* shows that the tibial head of our form is relatively much bigger than that of *Plateosaurus Reinigeri* and that the relations of the head of the tibia in *Plateosaurus erlenbergiensis*, *Plateosaurus poligniensis*, *Gresslyosaurus robustus* and in *Pachysaurus ajax* are quite different from those in our form.

It follows from the above considerations that the present form is new and belongs to a new genus. I therefore propose to call it *Eucnemesaurus fortis* n.g. et sp. (εὖ = good, κνήμη = tibia, σαῦρος = lizard; *fortis* = strong).

Gryponyx transvaalensis BROOM.

Through the kindness of Dr BROOM the Transvaal Museum now possesses the type specimens of *Gryponyx transvaalensis*. These consist of a clawphalanx and the distal end of a metatarsale. The claw has been described by Dr BROOM as belonging to the first digit of the right manus (8, p. 82, fig. 3). The clawphalanx is high and strongly curved. Its right side is somewhat

weathered, but it is still plainly visible that the groove for the claw on the right side lies slightly deeper than that on the left. There is a broad ridge on each side below this groove. The highest part of this ridge on the right side lies so far below its middle line, that it forms a fairly sharp lower edge to the right side of the bone. The highest part of the ridge on the left side of the bone follows the middle line of the ridge. The ridge on the right side passes further backwards than that on the left. There is a broad, thick, boss in front of the middle of the articulation surface on the left side. That on the right side is broken away. This boss is separated from the ridge in front of it by a broad groove, which passes downwards and then backwards above the tuberositas for the flexor tendon; upwards the groove is continuous with the groove for the claw. The greater part of the tuberositas for the flexor tendon is broken away. The articulation surface has completely disappeared by weathering. If compared with the clawphalanx of the first finger of *Massospondylus Browni* described hereafter, it will be noticed that what is called here right and left corresponds with medial and lateral respectively there. This therefore means, that the claw is not of the right manus as stated in the original description, but of the left. I do not think that it belongs to the same species as *Massospondylus Browni*, because the proximal end of the lateral side ridge lies relatively much higher, with regard to that of the medial side, than the proximal end of the lateral side ridge in *Massospondylus Browni*. Whether it belongs to the genus *Gryponyx* I am unable to say at present. Dr BROOM mentions "the vascular groove" and one is led to believe that only one such groove is present. This, however, is not so, for although the medial side of the bone is weathered, one can still distinctly trace the groove on that side. In the description of *Gryponyx africanus* (7, p. 296) Dr BROOM states of the clawphalanx of the first finger: "On the radial side is a marked vascular groove." As the statement stands, one concludes that such a groove is not present on the "ulnar side." However, I very much doubt the truth of such a conclusion and until it is contradicted I will accept *Gryponyx africanus* to have a clawphalanx of the first finger with two grooves for the claw, as in all other Triassic *Theropoda*.

The distal end of the metatarsale has been described as that of the second bone of the right foot. The breadth of the distal end is 3.8 cm. and its thickness 2.4 cm. The medial end of the axis of the articulation surface is slightly higher than its lateral end. The middle of the posterior surface immediately above the articulation surface is concave. Laterally it is bordered by a ridge, which runs upwards from the lateral lower corner of the surface and practically parallel to the lateral side. The medial posterior process of the distal end is short and directed about just as much outwards as inwards. The anterior surface shows a slight thickening above the middle of the articulation surface, bounded above by a very shallow, half-moon shaped concavity. On the lateral border of the anterior surface this concavity is bounded by a broad low boss, which forms at the same time the upper anterior knob-like process of the border of the lateral collateral pit. This pit has an upper, a lower and an anterior outlet. The section at the fractured end is broad laterally and narrow medially. Some of the characters of the bone, as for example the ridge on the posterior surface and the section of the shaft, point to a second metatarsale, but others, as for example those of the anterior surface, point to a third metatarsale. At present I am unable to decide the point.

Dromicosaurus gracilis n.g. et sp.

The following remains were collected by myself from the Red Beds of

Nauwpoort Nek, Bethlehem District. The exact locality is about 100 yards above the road from Bethlehem to Clarens as it passes through Nauwpoort Nek and on its right-hand side coming from Bethlehem. The remains consist of fragments of humerus and radius, a fairly complete neck-vertebra, some caudal vertebrae, the pubes, the ischia, a femur, a tibia, a fibula and some foot-bones.

NECK VERTEBRAE.

One neck-vertebra is preserved. It belongs to the anterior region of the neck and may possibly be the third vertebra (Pl. XVI, fig. 3). A portion of the neural arch with the processus spinosus is broken off. Its left side is still partially covered by matrix. It is cracked in different places and a broad crack affecting the length is now filled with matrix. The length of the centrum as preserved is 7.6 cm. Height of its anterior articulation surface 4.7 cm. Height of its posterior articulation surface 5.1 cm. Breadth of the anterior and posterior articulation surfaces 4.6 cm. and 4.7 cm. respectively. The lower surface of the centrum is deeply concave, the deepest part of this concavity lying about 3 cm. behind the anterior surface; the height of the centrum is here about 3 cm. and its breadth about 2 cm. Both the articulation surfaces of the centrum are deeply concave. The left praezygapophysis projects far forwards and its articulation surface is perfectly horizontal.

CAUDAL VERTEBRAE.

There are remains of some eight caudal vertebrae (Pl. XVI, fig. 1). They probably all belong to the anterior caudal region and are very badly preserved. The two biggest centra (Pl. XVI, fig. 1a) have a length of 5 cm. and a height of 6 cm. Their upper breadth is about 4.5 cm. The lower end of their distal articulation surface is strongly recurved for the articulation of the haemapophysis. The lower surface of the centrum is narrow and fairly flat; there may have been a very slight groove, but it is not visible now. The next following in size (Pl. XVI, fig. 1b) is only represented by the upper half of its centrum with its dorsal spine. One praezygapophysis is preserved. It is long and its articulation surface slopes inwards and downwards. The postzygapophyses are short and situated high up behind the dorsal spine. Their articulation surfaces have the same slope as of the praezygapophysis. The end of the dorsal spine is broken off; as preserved, its length is 5.5 cm. It is narrow and thick, breadth and thickness measuring 2 cm. and 1 cm. respectively, just above the postzygapophyses. The fourth and fifth vertebrae are slightly smaller than the third, but do not show any remarkable features. The other remains belong to three smaller vertebrae, the smallest of which has a length of 5.5 cm., while its articulation surfaces have a height of 3.8 cm. The lower ends of both articulation surfaces are strongly recurved. The lower side of the centrum is grooved (Pl. XVI, fig. 1c). The proximal end of a haemapophysis is preserved. The breadth of its upper end is 3.5 cm. and the length of its articulation surface is 2.7 cm. This must be one of the most anterior haemapophyses, for it fits exactly on to one of the large centra.

HUMERUS.

The distal end of the left humerus is preserved in a fragmentary condition, but the bone has apparently not suffered from pressure. The bone is broken off beneath the processus lateralis (Pl. XIV, fig. 6 and text-figs. 8 and 9). The lateral side of the shaft is also lost. The proximal plate must have made an angle of nearly 90° with the plane of the distal end. A narrow, high, rounded ridge runs from the extreme end of the condylus lateralis upwards to the lower

end of the crista radialis. The broad ridge running upwards from the condylus medialis seems to reach the medial side of the processus lateralis. The anterior surface between these two ridges is strongly concave; in its distal part this concavity contains a circular depression. The anterior surface of the distal end is concave. The breadth of the distal end is 9 cm. Thickness medial condyle 3.9 cm., breadth 5 cm. Thickness lateral condyle 4.3 cm., breadth



Text-fig. 8. *Dromicosaurus gracilis*. Distal end of left humerus. Outline of medial view. $\times \frac{1}{2}$.



Text-fig. 9. *Dromicosaurus gracilis*. Distal end of left humerus. Outline of distal surface seen from below. Medial side to the left. Less than $\times \frac{1}{2}$.

2.9 cm. The articulation surface of the lateral condyle is divided into two facets, an outer, which is directed downwards and inwards, and an inner, which is directed downwards and outwards, meeting in a ridge, which runs through the middle of the distal surface of the condyle and parallel to its lateral side. The lateral condyle leans over to the lateral side and the medial surface of the medial condyle is also directed forwards and sidwards. The distal surface of the medial condyle is convex; its medial portion is weathered.

RADIUS.

The proximal end of the left radius is present (Pl. XIII, figs. 5 and 6). The length of the articulation surface is 4.7 cm. and its breadth is 2.7 cm. The surface is cylindrically concave, and the axis of this cylinder is directed from the anterior end of the antero-medial border to the posterior end of the postero-lateral border. The concavity is deepest at its anterior end, where it makes the deepest notch in the border. The posterior part of the antero-medial border and the anterior part of the postero-lateral border are both drawn upwards; the former is slightly higher than the latter. The edges of the articulation surface are broad and rounded.

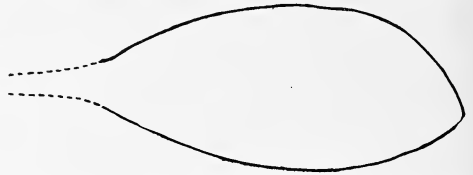
PUBIS.

When the fossil was discovered the pubes were still *in situ*, but all the covering matrix had completely weathered away. The proximal end of the right pubis was lost. The upper inner corner of the plate of the left pubis was present, but the portion which is bent downwards at this corner was absent. As preserved, the foramen obturatorium was therefore not completely closed. The anterior corner of the proximal end was weathered. The remainder

of both bones, right up to their distal ends, was cracked, but otherwise perfect. The distal two-thirds of the bones showed a remarkable feature. The two plate-like portions of the pubes were coalesced along the middle and formed only one bone. No division between the two pubic plates could be found. Through the cracks it was apparent that the pubic plate was very thin along its middle line. During excavation everything was done to keep the pubes intact, and they were even got out on a lump of rock, which was placed in a box. While I was busy with the excavation of the further remains, somebody else was kind enough to meddle with the transport of this valuable specimen. It was placed on the head of a Kaffir-boy who took it down hill and overturned the box into a wheelbarrow before it could be prevented.

After the pieces had been fitted together as far as possible the two pubes appeared as figured on Pl. XVI, figs. 4 and 5. The length of the most complete of the two, the left pubis, cannot be accurately given, for the distal end cannot be fitted on to the remainder. The length of the bone as preserved, without the distal end, is 34 cm. Then comes a gap, which may have a length of 5 mm. medially and of about 2.5 cm. laterally. The distal end has a medial length of 6.5 cm. and a lateral length of 8 cm. The total length of the bone may therefore have been 42 cm. It is very improbable that the length of the gap was greater, for I am under the impression that the two pieces of bone were separated medially by a crack filled up with matrix. Laterally of course a piece of bone has been lost. The distal ends of both pubes show their complete breadth. If they are placed alongside of each other the maximum breadth of the pubic plate of the combined bones at the distal end would be 16.5 cm. The breadth of the plate would

have been less in the middle, because the distal ends have lateral projections. The pubic plate is thickest near its lateral side. The lateral border is fairly sharp, but the bone thickens rapidly from this border inwards. It attains its maximum thickness before the middle of the bone is reached and it then thins out gradually towards the medial line, where the extremely thin bone was coalesced with its fellow (text-fig. 10). The maximum thickness of the left half of the pubic plate above its middle is 2.5 cm. Near its distal end the thickness is less than 2 cm. A piece of the present medial edge of the bone has a thickness of 3 mm. The distal end is very much thickened, that is to say, the hinder surface of the distal end bulges considerably backwards. The anterior surface of this end is slightly concave, through a slight thickening of the distal border. The lateral side bends slightly outwards at the distal end. The distal surface is very broad, because of the thick end (text-figs. 11 and 12). The hinder surface is concave from above downwards immediately above the distal surface. The maximum thickness of the distal end which lies midway between the sides is 3.5 cm. The maximum breadth of the distal surface is nearly 5 cm. The distal surface is convex and its lateral-hinder-medial border is half a circle. The anterior border is straight.



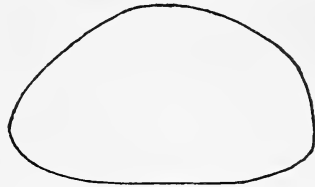
Text-fig. 10. *Dromicosaurus gracilis*. Outline of section through middle portion of left pubis seen from the distal end. Nat. size.



Text-fig. 11. *Dromicosaurus gracilis*. Outline of longitudinal section through distal end of left pubis. The anterior border is below. $\times \frac{1}{2}$.

This half circle and the front border lie in a plane which makes an acute angle with the anterior surface of the pubic plate.

Nothing is present of the bent-down portion at the inner proximal corner of the pubic plate. A broken edge indicates how far this bent-down portion continued towards the proximal end. From here the pubic neck continues towards the articulation ileo-pubica. The section of the neck is triangular as shown in text-fig. 2. The lateral border of the neck is a continuation of the lateral border of the plate, it is only slightly concave forwards. The hinder-outer surface of the neck is slightly convex. The neck has an anterior surface and an inner surface, which stand at right angles to each other. The anterior surface rounds off broadly into the inner surface. Both surfaces are concave from above downwards. The distance between the lateral border and the inner posterior border of the neck is 4 cm. The upper anterior corner of the bone and the articulation ileo-pubica are weathered away. The thickness of the head at the upper anterior end is about 5 cm. The processus subacetabularis is not only bent downwards at right angles to the neck, but its general direction is also practically perpendicular to the pubic plate. The medial border of its upper surface is fairly straight. The proximal portion of this upper surface has a high boss on its lateral border. The distal portion shows a deep concavity, which does not affect the medial border, but which continues over the lateral border. The medial surface of the processus is concave in all directions and strongly so from above downwards. Its general section is triangular. The length of the processus is about 7.5 cm. The breadth of its upper surface is less than 4.5 cm. The distal end of the processus subacetabularis is flat and has a process which is directed downwards, forwards and inwards. This process stands practically at right angles to the processus subacetabularis. Distally it turns more and more inwards; its section is triangular. The lower end of the hinder surface of this process is damaged. The upper border of the triangular articulation ischio-pubica, which is covered with small knobs and pits, has a breadth of about 4.5 cm. Its height as far as preserved is about the same. The breadth of the foramen obturatorium is 17 mm. Its length was more than 3 cm.



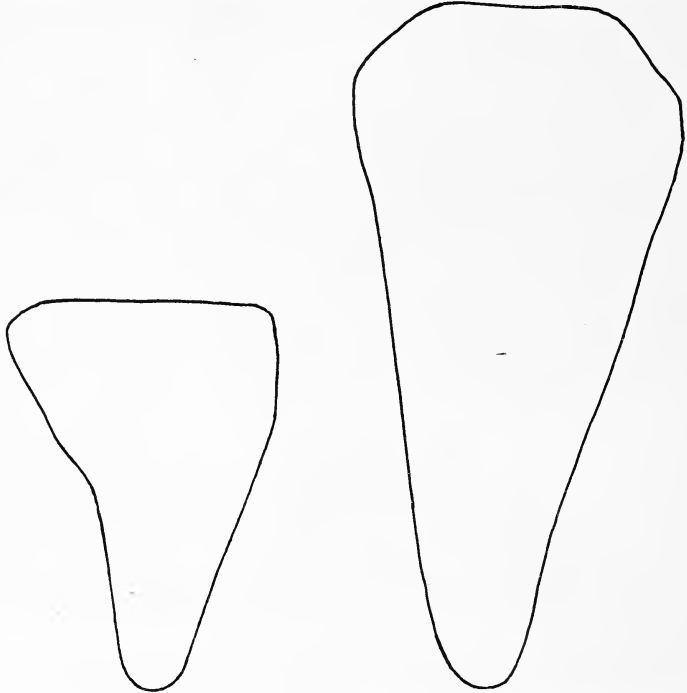
Text-fig. 12. *Dromicosaurus gracilis*. Outline of distal surface of pubis seen from distal end. $\times \frac{1}{2}$.

ISCHIUM.

Both ischia are present, but they are very much broken. The left ischium is fairly complete, but it is broken in two and the parts are joined by a thick band of matrix. The thin upper anterior portion is badly broken and the extreme distal end is lost. The distal end of the right ischium is complete, but its proximal end is lost (Pl. XV, fig. 4).

If the bones are combined, it will be found that the length of the ischium is 34 cm. The distal portion is straight and the proximal plate is turned slightly outwards. The breadth of the proximal plate with the processus subacetabularis (Pl. XV, fig. 6) is 11 cm. A small piece of the posterior portion of the proximal end is broken off and the bone has suffered somewhat from pressure. The original total breadth may therefore have been 12 cm. The posterior portion of the proximal surface has a breadth of 6.5 cm. as preserved. However, from this must be deducted 1 cm. for a seam of matrix, which passes in a sagittal direction through the posterior portion of the upper

end of the bone. The original breadth was, therefore, 5.5 cm. The surface is covered with numerous small knobs and pits. The outer border of this portion is formed by a long posterior and a short anterior sharp edge, which stand nearly at right angles to each other. The vertex of this angle is high and projects to the lateral side. The medial border of this surface passes upwards and forwards and, after reaching a point opposite the angle on the lateral border, downwards and forwards. There is a high boss on the proximal surface at the angle between these two medial borders. The medial and lateral angles of the border lie exactly opposite each other. The surface posterior to these two angles serves for articulation with the processus postacetabularis ilei. In



Text-fig. 13. *Dromicosaurus gracilis*. Left ischium. Outline of the articulation ischio-pubica seen from in front. Nat. size.

Text-fig. 14. *Dromicosaurus gracilis*. Right ischium. Outline of distal surface seen from the distal end. The medial border to the left. Nat. size.

front of the medial boss is a small triangular surface, which is bordered in front by a ridge; this ridge is a continuation of the anterior part of the lateral border and runs obliquely across the proximal surface, meeting the medial border further downwards than its starting point. Distally to this ridge is the processus subacetabularis ischii. The medial border of this processus is extremely thin and slightly concave upwards. The upper surface of the processus is concave. The edge with the lateral surface is rounded. The lateral surface of the processus is convex from above downwards. The medial surface of the whole proximal end is strongly concave from above downwards. The distal end of the upper surface of the processus makes an acute angle with the articulation surface for the pubis. The articulation ischio-pubica has a triangular shape (text-fig. 13) and the surface is covered with small knobs

and pits. Its upper border has a length of 3.5 cm.; the height of the triangle is about 5 cm. The articulatio pubica makes an angle of about 60° with the articulatio iliaca and an angle of about 40° with the general long axis of the ischium. The articulatio iliaca makes an angle of less than 25° with the general long axis of the bone. The thin anterior portion of the plate is damaged and its edge is broken off. Probably this edge was fairly straight or slightly convex between the lower end of the processus subacetabularis and the place where the proximal and the distal portions of the ischium form a curve. The thin anterior portion terminates at a distance of about 12 cm. below the proximal end. The posterior portion of the plate is thicker than the anterior portion. A few centimetres below the articulation surface its thickness is 18 mm. A broad groove starts at a short distance (1.5 cm.) below the articulation surface on the posterior edge of the lateral side. Through the twisting of the distal portion of the bone the groove soon passes on to its hinder surface. It cannot be made out how far this groove runs downwards. The distal end of the ischium has a flat hinder surface. Its section is triangular (text-fig. 14). The medial sides of the two distal ends lie against each other and although they are proximally separated by matrix, the two bones seem to be coalesced distally. The specimen is slightly pressed sideways, but probably the two hinder surfaces lie in a plane. The two lateral surfaces meet in a ridge. The distal end is thickened. The border of the distal surface projects posteriorly, laterally and anteriorly (Pl. XV, fig. 5). The distal surface is probably convex. The breadth of the hinder surface near the middle is 3.5 cm. and the thickness at the same spot 3 cm. The greatest breadth of the distal end of the right ischium is more than 4 cm. Its thickness is nearly 9 cm.

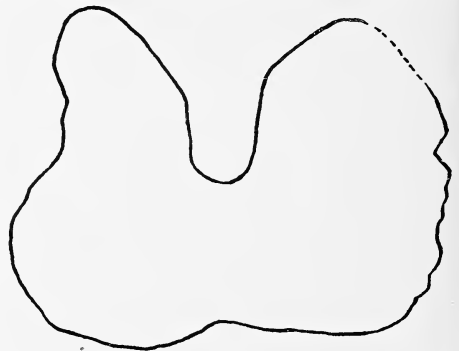
FEMUR.

The left femur is preserved (Pl. XIII, figs. 2—4, and text-fig. 15), but in a rather weathered condition. The caput femoris is broken off and in its lower half the femur was badly broken in two places. The pieces were fitted together by myself and joined with plaster of Paris. The length of the bone has not been influenced by these joints. It would not be exact to call the curvature of the diaphysis sigmoidal. Its middle portion is certainly convex forwards, but its upper end is not concave forwards as is usual, only less convex than the middle portion.

The length of the bone is 49.5 cm. The breadth of the proximal end cannot, of course, be given. The preserved portion of the proximal end rounds off into the lateral side; from opposite the upper end of the trochanter major the lateral side bends more and more inwards till near the proximal end, where the convexity becomes greater to pass over into the proximal surface. The trochanter minor was on the piece which is broken off and lost. The trochanter major is broken off. The upper end of the broken surface is situated at a distance of 7.5 cm. from the proximal end of the bone, and the lower end of the trochanter at a distance of 13.5 cm. from the same end. Between the lateral side of the preserved portion of the trochanter and the general surface of the bone there is a broad groove. The femur is broad and thin between its proximal end and the trochanter major; further downwards it becomes thicker. A broad ridge starts at the fractured edge of the proximal end, and coming from the direction of the caput femoris runs towards the trochanter major. In passing the trochanter it turns in the direction of the condylus medialis. The highest point of this ridge lies immediately below the trochanter major; its height diminishes towards the proximal end and towards the distal end, in the latter case to such an extent that it loses itself on the medial side

below three-fifths of the length of the bone. The trochanter major does not lie on the top of the ridge, but is situated on its lateral side. Immediately below and medial to the lower end of the trochanter major the top of the ridge shows a broad, flat, rough surface. Lower down the top of the ridge is rounded and rough, the roughness narrowing down towards the middle of the bone, where it disappears. The surface of the bone enclosed between the medial side and the ridge, as far down as the upper end of the trochanter quartus, is concave. The lateral side of the anterior surface of the bone, below the lower end of the trochanter major and exactly opposite the whole length of the trochanter quartus, is slightly concave. A large oval foramen nutritivum, length 8 mm., breadth 4 mm., is situated on the lateral side of the top of the ridge and still within the rough surface, at a distance of 11 cm. from the upper end of the trochanter major. The medial side of the proximal end is hollow. This concavity, with the curve in the ridge and the convexity of the lateral side, marks the inward bend of the proximal end of the femur. The hinder surface of the proximal end is flat. Opposite the upper end of the trochanter quartus it rounds off over the lateral side of the bone into the anterior surface. Higher up, however, from opposite the middle of the trochanter major up to the proximal end of the lateral side, it rounds off into an elongated, flattish, lateral surface. This lateral surface is separated from the anterior surface by a heightened narrow ridge.

The trochanter quartus begins at a distance of about 14.5 cm. from the proximal end of the bone. It terminates at a distance of about 21.5 cm. from that end. The height of the trochanter, as preserved, is 3 cm. Its upper edge is broken off and at the most it could have been 0.5 cm. higher. The medial side of the trochanter is overhanging; the lower end of the lateral side is steep, but the slope of its upper end is much less. These two portions of the lateral side meet in a clearly visible rounded ridge, which runs in the direction of the upper outer corner of the proximal end and seems to continue further upwards than the much higher medial ridge of the trochanter. The whole trochanter is situated nearer to the medial than to the lateral side of the bone; moreover, the upper end lies nearer to the medial side than the lower end and therefore the edge of the trochanter lies in the direction of the condylus lateralis. Medially to the trochanter quartus there is a large, flat, rough surface, which has apparently served for the attachment of muscles. It looks mostly inwards and only slightly backwards. A ridge starts at the upper end of this surface, and runs from the lateral side on to the posterior surface in the direction of the lateral corner of the proximal end, passing well above the upper end of the trochanter quartus, where it terminates. The breadth of the diaphysis over the trochanter quartus is 6.5 cm. Its thickness, measured from the top of the lower end of the trochanter to the top of the ridge on the anterior surface, just above the foramen nutritivum, is 8.5 cm. At about 18 cm. above the distal end these dimensions are 7.5 cm. and 3.5 cm. respectively. The thickness of the distal end, measured from the anterior



Text-fig. 15. *Dromicosaurus gracilis*. Left femur. Outline of distal end seen from below. Medial side to the right. $\times \frac{1}{2}$.

surface to the lower end of the fossa intercondyloidea, is 3.5 cm. Its thickness over the condylus medialis is 8.1 cm. and over the condylus lateralis 9 cm.

The upper end of the fossa intercondyloidea is damaged. It starts at least 12 cm. above the distal end. The condylus medialis is damaged; its breadth as preserved is 5 cm. Its height is about 6.5 cm. The condylus lateralis is much narrower; its breadth is 3.3 cm. The breadth of the distal end (text-fig. 15) is about 11.5 cm. The distal articulation surface is full of cracks and could not be well cleaned of matrix. The lateral side of the distal end is hollow and the hinder end of the condylus lateralis stands out slightly to the lateral side. The anterior surface of the distal end is hollow along its middle. Seen from the front it seems as if the lateral side of the bone runs slightly further downwards than the medial side. The diaphysis is hollow. The bone only forms a thin shell round a very large cavity.

TIBIA.

Only the right tibia is preserved and that in perfect condition. It has a large proximal articulation surface and a straight shaft (Pl. XIV, figs. 1—3, and text-figs. 16 and 17). During its excavation, the bone of the diaphysis parted in small fragments from the filling of its cavity; however, all the pieces were fitted and glued together on the spot. The total length of the bone is 37.5 cm. The head of the tibia (text-fig. 16) has a length of 13 cm., measured from the hinder end of the medial condylus to the edge of the anterior crest. Its greatest breadth, transverse to this greatest length, is 8.5 cm. The length of the lateral side of the head is 9 cm. Anteriorly the head of the tibia has a laterally directed process, the tuberositas tibiae. The lateral border of the proximal articulation surface is directed straight backwards from the tuberositas tibiae, but before reaching the lateral condylus it becomes slightly concave; the remainder of this border is convex. The medial border runs from the tuberositas tibiae inwards and curves slightly backwards until at about 3.5 cm. from the anterior end the convexity becomes greater. It diminishes again at about 5 cm. from the anterior end; from this point further backwards the medial border is only slightly curved, but the convexity is greater around the condylus medialis. The posterior border is slightly convex behind each condylus and notched in the middle. The proximal articulation surface shows a large shallow concavity above the medial condylus; another large concavity is situated on the anterior end, while the upper surface of the lateral condylus is convex. The lateral posterior side of the surface is slightly lower than the medial posterior side. From the hinder border the articulation surface goes steeply upwards and forwards. The hinder border is overhanging; it rounds off abruptly into the lateral border; its medial end is slightly damaged. The shaft narrows down quickly immediately below the head.



Text-fig. 16. *Dromicosaurus gracilis*. Right tibia. Outline of proximal surface seen from above. Lateral side to the right. $\times \frac{1}{2}$.

The distal end is transversely broad. The medial one-third of the distal articulation surface is flat and slopes slightly from its anterior edge backwards

and downwards. The lateral part of the distal articulation surface consists of an anterior and a posterior portion (text-fig. 17). The anterior portion, which is the distal surface of the processus tibiae anterior distalis, occupies a much higher position than the posterior portion, which is the distal surface of the processus tibiae posterior distalis. The distal surface of the processus posterior is continuous with the medial portion of the articulation surface. It slopes upwards from the lateral to the medial side and from the posterior towards the anterior border. The medial portion of the articulation surface is connected with the distal surface of the processus anterior by means of a short and very steep surface. The distal face of the processus anterior slopes from its medial end upwards and outwards, and from its anterior border backwards and slightly upwards. Medially the processus posterior is nearly as broad as the processus anterior. Towards the lateral side it becomes narrower and it terminates in a point. This end is bent very slightly forwards. Both ends of the distal surface of the processus anterior are broad, but the inner end is slightly broader. Apparently, the lateral end of the processus anterior does not project further outwards than the processus posterior. The highest point of the lower surface of the processus anterior is situated 37 mm. above the lowest part of the processus posterior. There is a slightly concave surface (sulcus malleoli tibiae) immediately behind the lateral end of the processus anterior. This surface passes downwards between the processi and is continuous with the concave upper anterior surface of the processus posterior; it passes inwards for a short distance only. The breadth of the distal end, along the front border of the articulation surface, is 82 mm. This front border is laterally slightly concave and medially, where a small piece of the edge is broken off, it is slightly convex. The medial border makes an acute angle with the anterior border and an obtuse angle with the posterior border. The borders round off into each other. The breadth of the medial side, measured parallel to the medial border, is 56 mm. The posterior border converges slightly with the anterior border towards the lateral side; its length is 60 mm. The distance from the anterior medial corner of the distal end to the lateral end of the processus posterior is 1 mm. longer than to that of the processus anterior.

A broad high ridge runs down from the tuberositas tibiae in the direction of the anterior medial corner of the distal end. It does not reach this corner, however, for it terminates at about 6 cm. above the distal end. The surface between the lower end of this ridge and the distal end of the bone is concave. The lateral anterior edge of the distal end is broadly rounded below. Higher up the edge becomes a fairly sharp ridge; then again the ridge becomes broad and low and finally disappears above the middle of the bone. There is a broad, oval and very low boss on the lateral side of the bone, below the notch in the lateral border of the proximal surface; its upper end lies about 4 cm. below the notch and its lower end about 8 cm. Its breadth is about 2.5 cm. The thickness of the bone in the middle is 5.5 cm. and its breadth at this place about 4 cm. The thickness of the distal end is about 5 cm.



Text-fig. 17. *Dromicosaurus gracilis*. Right tibia. Outline of distal surface seen from the distal end. Anterior border below. Lateral side to the right. $\times \frac{1}{2}$.

FIBULA.

Of the fibulae only the right bone has been found and this is in excellent condition. It has a length of 34.5 cm. v. HUENE has already pointed out that one can readily ascertain whether the fibula belongs to the left or to the right side. The lateral side of the proximal end is convex. The thin and low portion of the proximal end is anterior, the thick portion posterior.

In the following description the bone is so placed that the inner border of the posterior portion of the proximal articulation surface is directed straight backwards (Pl. XV, figs. 1—3). The proximal articulation surface is convex from side to side and its anterior portion is bent inwards (text-fig. 18). The whole surface is covered with irregular grooves and ridges. The anterior portion of the proximal end of the bone is strongly directed inwards; it is really a high, thin, anterior process. Its most anterior point lies far below the articulation surface. The lateral surface of the posterior portion of the proximal end is evenly convex. That of the anterior portion is slightly concave. Between these two portions the lateral surface is strongly convex. The posterior portion of the medial surface is flat; its anterior portion is slightly concave. There is a broad low boss slightly below the middle of the inner surface of the proximal end. From the posterior corner of the proximal end a broad ridge passes downwards and inwards for a short distance; it narrows down quickly and ends opposite the middle of the broad boss on the inner surface. The greatest breadth of the proximal end is 7.7 cm. Its greatest thickness is 2.8 cm. The thickness of the bone over the broad boss is 3 cm. The shaft narrows down rapidly immediately below the head. At a distance of 9 cm. from the proximal end the breadth of the bone has diminished to 3.5 cm. and the thickness to 2.1 cm. At a distance of 15 cm. from the proximal end the breadth of the bone is reduced to 3 cm., but the thickness has increased and is at this spot 3 cm. The greatest horizontal dimension of the shaft at this distance from the proximal end is 3.4 cm. This is due to a broad, high ridge on the lateral surface of the bone. This ridge starts very gradually at a distance of about 9.5 cm. from the proximal end on the anterior border of the lateral side of the bone. It ends at about 19 cm. from the proximal end. The distal end of the ridge is situated in the middle of the lateral surface of the shaft. The posterior side of the ridge is slightly concave at its upper end, but at its lower end it passes gradually into the posterior surface of the bone. The anterior side of the ridge is slightly concave. The anterior edge of the bone passes down as a low ridge along the medial side of this concave surface. There is a large oval depression on the anterior surface of the bone, medial to the low ridge just mentioned and looking slightly inwards. The medial side of this depression is slightly elevated above the medial surface. The upper and lower ends of the depression lie at a distance of 12 cm. and 15 cm. respectively from the proximal end. Slightly below the oval depression the low ridge subsides into the general surface of the bone. At a short distance from the depression the anterior edge again assumes a ridgy appearance. This ridge, however, is not a continuation of the preceding ridge, for the lower end of the latter lies higher than and lateral to the upper end of the former. This ridge runs downwards for a short distance and then also subsides into the general surface of the bone. A foramen nutritivum of about 6 mm. length



Text-fig. 18. *Dromicosaurus gracilis*. Right fibula. Outline of proximal end seen from above. Medial side to the left. $\times \frac{1}{2}$.

and 2 mm. breadth is situated on the medial surface, at a short distance below the oval depression. The hinder surface of the bone is narrow and rounded. The edge between the hinder surface and the medial surface is rounded in its upper two-thirds. At the upper end of its lower third it forms a short, sharp and low ridge, the lower end of which lies 10 cm. above the distal articulation surface. From this ridge two diverging ridges run towards the distal end. The posterior one is low, broad and rounded at its upper end; at its lower end it is a high and broad ridge, the edge of which, however, is broken off. As the medial-posterior side of the distal end is weathered, one cannot be sure whether this ridge reached the border of the articulation surface; there are indications that it did not. The anterior ridge is also low, broad and rounded at its upper end, but its lower end is high and narrow, this being the result of the medial and anterior surfaces meeting at an acute angle. This ridge runs right down to the antero-medial corner of the distal end. The medial surface between the two ridges is concave. The posterior and anterior surfaces of the distal end are narrow and slightly convex in horizontal section. In a vertical direction they are concave, especially the anterior surface. The lateral surface of the distal end is narrow and very convex in horizontal section; it is slightly concave from above downwards. The distal articulation surface (text-fig. 19) has somewhat the shape of an oval. Its long axis makes an angle of slightly more than 45° with the sagittal line. Its anterior end lies medially and its posterior end laterally. The articulation surface is covered with irregularities but is generally flattish. It slopes from the antero-medial end downwards to the postero-lateral end. The difference in height of the two corners is about 16 mm. The postero-medial border is weathered, but was probably an evenly convex line from the antero-medial end to the postero-lateral end. The border of the postero-lateral end is broadly rounded, that of the antero-medial end bluntly pointed. There is a short, straight anterior border running from the antero-medial end outwards till past the middle of the distal end. The front border is connected by another straight border with the postero-lateral end. The distance from the antero-medial corner to the postero-lateral corner is 6.2 cm. The breadth of the distal end as preserved is 3.3 cm. The diaphysis is bent and concave medially. At a distance of 20 cm. from the proximal end the breadth of the shaft (transverse dimension) is 2.5 cm. and the thickness 2.6 cm.



Text-fig. 19. *Dromicosaurus gracilis*. Right fibula. Outline of distal end seen from below. Anterior border above. Medial side to the right. $\times \frac{1}{2}$.

Foot.

The foot is represented by some well-preserved fragments.

Metatarsale I is represented by two pieces, one of which is the proximal end of the right bone (text-fig. 20). Its breadth is 5 cm. and its thickness 2.4 cm. The length of the piece is 5.5 cm. There is a narrow ridge in front which passes into the rounded anterior surface of the shaft before reaching the end of the piece. A broad ridge runs downwards from the middle of the lateral border of the proximal articulation surface; it reaches the anterior border of the shaft at the fractured end. Posteriorly the bone has a broad rough edge. Further downwards this edge is smooth and passes into the rounded posterior surface of the shaft. There is a slight angle between the rough and the smooth surface. The medial surface bends to the lateral side near the posterior border. The proximal surface is hollow in the middle;

this cavity passes forwards and outwards and over the anterior lateral border.

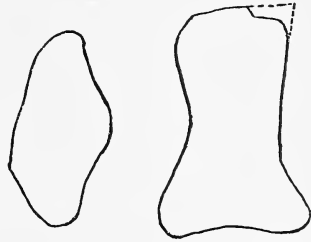
The other piece is a fragment of the distal end of the right bone (Pl. XIII, fig. 8). The globose part of the articulation surface has a thickness of 2.7 cm. The lateral collateral pit has a tremendous size. It has a length of 2 cm. and a breadth of 1.2 cm. Its upper anterior and lower posterior ends are open. The cavity has a more or less cylindrical shape. That this piece must belong to the right bone is shown by the fact that its latero-posterior surface is concave close to the medial fracture, which concavity is a portion of the large concavity on the latero-posterior surface, well-known from other first phalanges. The antero-medial surface of the bone is separated by a ridge from the articulation surface.

Metatarsale II is only represented by the proximal end of the right bone (text-fig. 20).

The proximal articulation surface has the shape of a quadrangle. All four sides of this quadrangle are concave. The medial side is deepest in the middle, while the deepest place of the lateral side lies nearer to the hinder border. The lengths of the different borders of the proximal surface are: medial 5.7 cm., lateral approximately 6 cm., posterior 4.1 cm. and anterior approximately 3 cm. Ridges run from the corners of the proximal surface downwards on to the shaft. The upper end of the antero-lateral ridge is rounded, but very probably it was sharp. The antero-medial ridge is rounded. The base of the postero-medial ridge is broader than that of the postero-lateral one. The proximal surface of this last ridge is slightly lower than that of the former one. The postero-lateral ridge stands further out from the bone than the postero-medial one. The anterior border of the proximal surface overhangs the anterior surface of the bone. The length of the piece is 4 cm.

Metatarsale III. There is one piece which, I take it, belongs here, viz. the distal end of the right bone. Its medial side is missing (Pl. XIV, fig. 4). The lateral side has a thickness of 2.4 cm. The lateral collateral pit is very deep. Its hinder edge has a small process behind the middle of the pit and its anterior edge has two knob-like processes with a groove in between. The upper knob-like process is separated from the process on the hinder edge by a deep groove. A rounded ridge passes on the anterior surface inwards and slightly upwards from the upper knob-like process. The anterior surface is slightly concave between this ridge and the articulation surface. I am not quite certain of the identification of this bone.

The last bone of this collection is also difficult to identify. It is probably the proximal end of the left ulna and although there is no certainty on this point I will here describe it as such. The length of the piece (Pl. XIV, fig. 5) is nearly 8 cm. Its antero-medial side is weathered. As preserved, the length of the lateral border of the proximal surface (text-fig. 21) is 3.6 cm. The length of its posterior border is 5 cm. The length of its antero-medial border was greater than 5.6 cm. The proximal surface is divided into two portions by a high ridge, which passes over the surface from the middle of the posterior to the middle of the antero-medial side. The portion of the proximal surface which lies medial and posterior to this ridge is convex and slopes down towards



Text-fig. 20. *Dromicosaurus gracilis*. Metatarsale I and II of the right side. Outline of proximal end of the bones, seen from the proximal side. $\times \frac{1}{2}$.

the postero-medial corner of the surface. The portion of the proximal surface which lies lateral and anterior to the ridge slopes more strongly forwards and is concave medially. The posterior border of the surface is concave laterally and convex medially. The lateral border overhangs the lateral surface of the shaft. The antero-medial corner is slightly lower than the postero-lateral one.



Text-fig. 21. *Dromicosaurus gracilis*.
Outline of the proximal end of
the left ulna (?), seen from the
proximal side. Posterior side to
the left and lateral side above.
 $\times \frac{1}{2}$.

If this is actually the proximal end of the left ulna, then a large portion of the antero-medial angle of the head has worn away.

DISCUSSION.

It will not be necessary to compare with the Plateosaurid *Eucnemesaurus*, for the present form is plainly an *Anchisaurid*.

The trochanter quartus of our form lies relatively much deeper than that of *Plateosaurus stormbergensis*.

A comparison with *Massospondylus carinatus* is difficult, because most of the type remains are fragments. The head of the pubis shows some important differences. In the first place the length of the head of the pubis of *Massospondylus carinatus* as figured by v. HUENE (4, p. 38, fig. 51), and measured from the articulation ischio-pubica straight across to the anterior surface, is 9.6 cm. In our form the upper anterior portion of the head is damaged. As preserved, the length of head and processus subacetabularis together is 7.1 cm. In the above the total length of the undamaged head was estimated at 7.5 cm. It can certainly not have been more than 8 cm. It appears, therefore, that the pubic head of *Massospondylus carinatus* is longer than that of our form. It is, however, apparent from the femur that our form is a bigger animal than the type of *Massospondylus carinatus*. The pubic head is, therefore, relatively much longer than that of our form. The thickness of the head is about half that of our form. The section of the neck of the pubis, which has the shape of a very elongated oval with pointed ends, differs considerably from that of the present form.

The coalesced portion of the ischia shows different sections to that of the form just described. Sections of the coalesced portion in our form are triangular everywhere, they do not even approach the rounded form of the distal end of the *Massospondylus* fragment.

The length of the femur of *Massospondylus carinatus* is estimated at 43 cm. The length of the lower portion below the trochanter quartus is about 22 cm. In our form these lengths are 49.5 cm. and 28 cm. Our femur, therefore, is longer. In the femur of *Massospondylus carinatus*, however, the trochanter major lies 9 cm. below the proximal end, while in our form this distance is only 7.5 cm. The breadth of our femur above the trochanter major is 7.5 cm. and its thickness there is 3.6 cm. (the bone is not crushed). In *Massospondylus carinatus* these dimensions are 7 cm. and 4.4 cm. respectively. These dimensions show, therefore, different relations in the two bones.

The tibia of *Massospondylus carinatus* is not complete. However, the proximal and distal ends are preserved. v. HUENE gives the following measure-

ments of the head: length of the medial side 11 cm., of the lateral side 9.5 cm. and greatest breadth 7.5 cm. (4, p. 42). These dimensions in our form are 13 cm., 9 cm. and 8.5 cm. respectively. From these measurements it will be clear that the relations of the two tibia bones are different. In *Massospondylus carinatus* the distal end of the tibia has the following dimensions: length anterior border 6 cm., medial border 4.5 cm., posterior border less than 4 cm. and lateral border 4 cm. In our form these dimensions are respectively 8.2 cm., 5.6 cm., 6 cm. and 4.2 cm. In *Massospondylus carinatus* the medial border of the distal end is longer than the posterior border, in our form it is the reverse. The above-mentioned differences may be regarded as sufficient to exclude our form from the genus *Massospondylus*.

Massospondylus Harriesi is very much smaller than our form. The distal end of its femur, measured from the lower end of the trochanter quartus, is 15.5 cm. In our form this portion measures 28 cm. The proximal end of the tibia of *Massospondylus Harriesi* measures 10.2 cm. \times 5.2 cm. If the same relations existed in our form as in *Massospondylus Harriesi* the tibial head of the last should have a length of $13 \times 15.5 : 28 = 7.2$ cm. The head of the tibia of *Massospondylus Harriesi* is therefore much longer than in our form. Length and breadth of the head of the tibia in our form are 13 cm. and 8.5 cm. respectively. If the same relations existed, the breadth of the head of the tibia in *Massospondylus Harriesi*, with regard to its length, should be $8.5 \times 10.2 : 13 = 6.67$ cm. Therefore, the head of the tibia in *Massospondylus Harriesi* is relatively narrower than in our form.

A comparison with *Aetonyx palustris* is difficult, because what is present in the one is missing in the other (7, p. 304). In *Aetonyx palustris* the width of the lower end of the humerus is 5.7 cm. In our form it is 9 cm. The length of the humerus in *Aetonyx* is 17.4 cm. If the same relations exist in our form, the length of our humerus should be $17.4 \times 9 : 5.7 = 27.5$ cm. In *Aetonyx palustris* the lower end of the delto-pectoral ridge lies 10.1 cm. from the upper end of the bone. This measurement and the length of the bone have been verified in the figure and were found to be correct. The distance of the lower end of the delto-pectoral ridge from the distal end of the bone, measured in the figure, is 9.2 cm. This may be slightly more in reality through foreshortening, and also because of the damaged condyle. With the same relations the lower end of the delto-pectoral ridge in our form should lie at a distance of $9 \times 9.2 : 5.7 = 14.4$ cm. from the distal end. With regard to the curvature at the upper end of our fragment and after comparison with other humeri, I come to the conclusion that it must lie at a distance of, at the very most, 13 cm. from the distal end. However, with a slightly longer upper end the total length of the bone would then come near the result obtained above. In *Aetonyx palustris* the proximal width of the second metatarsale is 2.5 cm. and that of the third metatarsale 2.6 cm. It could not be made out whether Dr BROOM means the greatest dimension of the proximal ends or the breadth along one of the borders of the bones. From the description of *Massospondylus Harriesi*, however, I conclude that the greatest dimension is meant. In our form the greatest dimension of these two ends is 6.7 cm. and 5.6 cm. respectively. The greatest breadth of our metatarsale II is 4.1 cm. and of metatarsale III 3.6 cm. In both cases, therefore, the proximal end of our metatarsale II is larger than that of metatarsale III, whereas in *Aetonyx palustris* the proximal end of metatarsale III is only slightly wider than that of metatarsale II.

The head of the tibia is relatively shorter in *Thecodontosaurus skirtopodus* than in our form (4, p. 44). The femora of *Thecodontosaurus Browni* (2, p. 124

and 4, p. 46) are much more curved than in our form. In *Thecodontosaurus Browni* the femur has a length of 24 cm. and the lower end of the trochanter quartus lies 11 cm. below the proximal end. In our form these measurements are 49.5 cm. and 21.5 cm. respectively, and it easily follows that the trochanter quartus lies relatively higher in our form than in *Thecodontosaurus Browni*. The trochanter major lies also relatively higher in our form.

Although our tibia is shorter than that of *Gryponyx africanus*, its head is absolutely broader. The relations of the head of the tibia in *Gryponyx africanus* are altogether different from those in our form. The shape of pubis and ischium is also quite different.

A comparison of the ischium of the present form with the well-preserved one of *Teratosaurus suevicus* H. v. MEYER (5) shows that, where the last is twice as long as broad, the ischium of our form is more than three times as long as broad. Casually connected with this greater relative breadth is the fact that the articulation surfaces of the ischium of *Teratosaurus suevicus* make much greater angles with each other and with the shaft of the bone than in our form. In the present form the articulatio iliaca makes an angle of less than 25° with the long axis of the ischium. The articulatio pubica makes an angle of about 40° with the long axis of the ischium and of about 60° with the articulatio iliaca. In *Teratosaurus suevicus* these different angles are respectively 55°, 75° and 130°.

If we compare the fibula of the present form with that of *Plateosaurus Quenstedti*, we are at once struck by the great difference between the two. The proximal end of our fibula has a large posterior process, while the posterior border of the upper end of the fibula of *Plateosaurus Quenstedti* is evenly rounded. The shaft in our form becomes a narrow rod in the middle, while in the fibula of *Plateosaurus Quenstedti* it is proximally very broad and distally only slightly narrower. The medial view of the distal end of the fibula of *Plateosaurus Quenstedti* does not show the medial ridge of our form. The anterior ridge of our form is broad distally, but it does not bear a smooth surface as in *Plateosaurus Quenstedti*. Our fibula also differs from *Gresslyosaurus* cf. *Plieningeri* through its large proximal posterior elongation.

It appears, therefore, that the present form is new and belongs to a new genus. The form is allied to *Aetonyx* and *Massospondylus* and is, therefore, an *Anchisaurid*. I propose to call this new form *Dromicosaurus gracilis* n. g. et sp. (δρομικός=quickly walking). The slender leg must have enabled the animal to go quicker than, for example, *Eucnemesaurus* and also implies a more slender form.

Massospondylus Browni SEELEY.

The remains which are being described under this name have been discovered on the farm St Fort (Letsoanastad No. 528 of 1905 map of Bethlehem District) by its owner, Mr H. WALKER, who very generously presented them to our institution. They consist of a vertebral column, front and hind legs, pectoral and pelvic girdle, all of one animal. The exact spot of the occurrence is in the Red Beds on the boundary between Clifton and St Fort immediately to the north of an old road through a Nek crossing this boundary, the Nek lying to the north of a hill which projects into the big bend of the Little Caledon River on St Fort. The spot lies about ten feet below the thick banks of the Cave Sandstone. A good search was made for the skull and a portion of the neck, which could not have been removed by weathering, but nothing further was found.

CERVICAL VERTEBRAE.

Five of the neck vertebrae have been preserved. They form an unbroken series, the last of which is at the same time the last neck vertebra (Pl. XXI, fig. 3). They are all in very bad condition, flattened and crushed, and the last one is nearly unrecognisable. The lengths of their centra are, from the anterior one backwards, 9 cm., 9 cm., 7.5 cm., 7.5 cm. and ? cm. As preserved the first and second of the series are slightly keeled, especially anteriorly and posteriorly. The third and fourth are more strongly keeled, although their lower borders are still concave. The fifth is strongly keeled, but that is all that can be said about it. Most of the dimensions are useless, and the general appearance of the vertebrae will be best understood from the figures. The breadth of the dorsal spine in the first four vertebrae is respectively about 5 cm., about 6 cm., about 5 cm. and 4.5 cm. The praezygapophyses of the second vertebra have a length of about 4.5 cm. The articulation surfaces of all the zygapophyses converge downwards. There is a slight ridge on the neural arch, just above and parallel with the neural suture. Posteriorly this ridge is evenly rounded, but in the third vertebra its lower side is hollow over about two-thirds of its length starting in front, and it forms, therefore, a downward leaning crista over this distance. In the more anterior vertebrae this crista is shorter. The diapophysis is situated on the anterior portion of this crista. It is not preserved. The parapophysis, which is situated near the anterior edge of the centrum, is either broken off or covered by the proximal end of a rib. Some of the ribs of the neck vertebrae are in good preservation. The tuberculum branches off from near the proximal end of the rib under an acute angle. Its articulating end is broken off in most instances; a portion of it is preserved in one rib and it is shown to be hollow upwards. In this specimen its length is 2 cm. This rib probably belongs to the fourth vertebra of the series; its probable fellow is also present. The capitulum is an inward process, which is not given off at the extreme proximal end of the rib, but slightly distal to it. The rib therefore has a small anterior process in front of the base of the capitulum. The capitulum is a thick round process directed forwards and inwards, with an expanded, circular, hollow articulation surface. In the ribs which probably belong to the fourth vertebra of the series its length is 5 and 7 mm. and the breadth of its articulation surface 8 mm. The length of the capitulum of the third vertebra is 3 mm. and the breadth of its articulation surface 9 mm. In the second vertebra the rib has a capitulum with a cup-shaped articulation surface attached to its inner side and near its end. The ribs were so long when they were found that their thin distal ends projected beyond the hinder ends of the vertebrae. The right rib of the first vertebra still shows a length of 8.5 cm. and both ends are broken off.

DORSAL VERTEBRAE.

All the dorsal vertebrae have been preserved, but in such a bad condition that the exact number of dorsals cannot be given with absolute certainty. If the remains of a vertebra behind the last neck vertebra are those of the first dorsal, then the second dorsal is only represented by its zygapophyses. From the third onwards the series is complete. It is difficult to decide which vertebra is the last dorsal. If the above assumption is right, then the fifteenth of the series was the first between the ilea. For reasons which will be stated later, I take this vertebra to be the first sacral. The number of dorsals therefore is 14, if the assumption of the first dorsal is right. It is not impossible, although very improbable, that a vertebra is missing between the last neck

vertebra and what is here called the first dorsal. It is also possible that more than one vertebra is missing between the first and the third dorsal. This, however, is also very improbable, for the fossil was excavated by myself and there was sufficient space for one vertebra only at this spot. It is therefore fairly certain that the fossil did not have more than fourteen dorsal vertebrae.

The postzygapophyses of the first dorsal are very long, their length being 2 cm. Those of the second and third are slightly shorter, while those of the fourth have a length of 1.2 cm. The processus spinosus of the fourth vertebra has a height of 3 cm. while its length is slightly more than 3 cm. The length of the centrum of the fourth vertebra is about 5 cm.; that of the sixth, the ninth, the tenth, the twelfth and the thirteenth is about the same. All the vertebrae are so flattened, however, that it is impossible to give accurate dimensions, and the above are only given to assist one in getting some idea of the size. The eighth vertebra shows a thick and nearly vertical posterior supporting ridge of the processus transversus. The ninth shows also the narrow anterior one, which slopes forwards and downwards; at its anterior end lies the large parapophysis. In the tenth vertebra (Pl. XXI, fig. 2) the posterior supporting ridge is thick and connects the processus transversus with the posterior edge of the centrum. The anterior supporting ridge lies nearly horizontal. At its anterior end and at the base of the praezygapophysis lies the large parapophysis, completely above the centro-neural suture. In the eleventh vertebra the posterior supporting ridge is thick and the anterior ridge thin, but the last is shorter than in the tenth vertebra. In the twelfth vertebra the posterior supporting ridge is thick and the anterior one thin; the anterior one is shorter than in the eleventh dorsal and to such an extent that the transverse process and the parapophysis are nearly touching each other. The processus spinosus of the tenth vertebra has a height of 3.7 cm. and a breadth of 4.4 cm.

SACRAL VERTEBRAE.

The three sacral vertebrae have also been preserved, but they are in the same condition as the dorsals. The second sacral is the longest; its length is 5.4 cm. That of the first sacral is 4.4 cm. and that of the third 3.8 cm. These three vertebrae were found between the ilea. In the *Plateosauridae* the second sacral is the longest and for this reason I take the longest of the present three to be the second sacral. The vertebra in front of it must then be the first sacral and the one anterior to that the last dorsal.

CAUDAL VERTEBRAE.

An unbroken series of eleven caudal vertebrae has been preserved (Pl. XX, fig. 5). The first caudal is only represented by an anterior and a posterior piece of its centrum. Haemapophyses are present on all the caudals beginning with the first, except on the fourth from which it is missing. I cannot be quite sure that there is nothing missing between the last sacral and what I call the first caudal, because there was a slight fault in the rock which had displaced the two bones with regard to each other. I think it very unlikely, however, that a vertebra is missing between them. The first caudal was wedge-shaped. The length of the lower surface of the centra and their anterior height is as follows: second caudal 4 cm. and 4.5 cm., third 4 cm. and 4 cm., fifth 4.8 cm. and 3.7 cm., sixth 4.5 cm. and 3.4 cm., seventh 4.5 cm. and 3.4 cm., ninth 4.2? cm. and 2.8 cm., eleventh 4.3 cm. and 2.6 cm. Through the crushing of the vertebrae, which, however, is not so great as in the dorsals, these measurements do not give the actual size of the original uncrushed bones; they are, however, not far out, and they give some idea of the relative

size of the vertebrae. From the second caudal onwards the lower surface of all the centra is grooved. This groove is more clearly visible in the sixth to the eleventh caudal. The groove is deep in its posterior end, where it cuts slightly into the lower margin of the posterior articulation surface. The transverse processes are broad and thin; they are directed outwards, backwards and upwards. Their base is still broad in the last vertebra. The dorsal spines are high and narrow; even the dorsal spine of the third caudal only attains a breadth of 1.7 cm. in its upper end, which is much less than half that of the tenth dorsal. Its length was about 6 cm. The dorsal spines of the sixth to the tenth caudal are preserved. There is an interval between them and the praezygapophyses. Their anterior edge is sharp. The length of the seventh is nearly 6 cm.; that of the tenth nearly 4.5 cm. The posterior edge of the dorsal spine is a sharp ridge above, but below this sharp ridge runs into a groove formed by the backward projecting lower end of the sides of the spine. The praezygapophyses are long and stand out forwards and upwards. Their articulation surfaces are perpendicular in the sixth to the tenth caudal (the others are not or too badly preserved) and each is parallel with its fellow. The postzygapophyses are short and are situated high up behind the dorsal spine.

The haemapophysis of the first caudal has lost its proximal and its distal end. As preserved its length is 9.5 cm. That of the second caudal has lost its distal end only and its length as preserved is 11 cm. There is a deep groove downwards from the proximal end on the anterior and on the posterior edge. The haemapophysis of the ninth caudal was also longer than 11 cm. The proximal end has two articulation surfaces, a larger anterior one and a narrow, half-moon shaped posterior one. The two surfaces stand in such a way that, when they are applied to the vertebra, the axis of the haemapophysis makes an angle of about 45° with the axis of the vertebra.

SHOULDER GIRDLE.

Scapula and coracoid of the right side are present, but also in very bad condition.

The scapula (Pl. XVII, fig. 1) has a length of 25.5 cm. Its breadth at the narrowest place in the middle is 3.8 cm. Its breadth at the distal end cannot be given accurately for the upper corner is broken off; as preserved it is 5.2 cm.; it may originally have been 7 cm. The breadth at the proximal end, from the top of the processus deltoideus as preserved to the lower border of the facies glenoidalis pro humero, is 8.5 cm.; originally this may have been 10.5 cm. The thickness of the scapula at its distal end is 0.9 cm. Near the lower border of the curved portion the thickness is 1.7 cm. The thickness of the bone at the articulation surface for the humerus is 2.8 cm. The distal edge is broken off and nothing is visible of a thickening at this border. This may also be the result of crushing. The processus deltoideus is broken off. There is an indication of a circular depression in front of the processus deltoideus, but there is not a trace of a distal sharp edge to this depression. The articulation surface for the humerus is broad. Its inner portion projects further downwards and forwards than its outer portion. The distal end of the scapula is straight; in its proximal half, however, the bone is curved with the concavity inwards.

The coracoid (Pl. XVII, fig. 1) is an outwardly convex and inwardly concave plate. A large piece of its upper portion is lost. The upper portion is thin and the lower portion thicker. The articulation surface for the humerus is too much damaged for description and the articulation surface for the scapula is covered by that bone. The foramen supracoracoideum lies at a distance of

5.5 cm. above the lower border. It is a round opening of about 9 mm. diameter. The foramen passes obliquely through the bone, upwards, backwards and inwards.

HUMERUS.

Both humeri have been preserved, but both have suffered much from pressure. The proximal plate of the right humerus has been flattened and broadened, while the plate of the left one has been compressed. The shaft of the right humerus has been twisted.

The length of the humerus is 20.5 cm. in the left (Pl. XVII, figs. 2 and 3) and 21.5 cm. in the right bone. The broad surfaces of the distal end of the humerus make an angle with those of the proximal plate. The thick medial border of the proximal plate is concave. The caput humeri is not situated at the extreme end of the medial border, but it lies more inwards on the upper border, of which it forms the highest point. From here the upper border runs outwards and downwards to the lateral side. The fossa bicipitis lies below this border and is bounded medially by the thick medial edge and laterally by the convexity of the crista radialis. It does not pass on to the shaft. The crista radialis projects from the lower end of the lateral side of the plate. Its height is about 0.6 cm., and its length about 5 cm. The upper end of the crista stands out from the rest of the lateral border towards the medial side and consequently the medial surface of the crista and a portion of the plate near it is convex. The posterior surface of the plate is convex, except the portion medial to the caput humeri, which is concave, and the posterior surface of the crista, which is also concave. There is a circular depression on the posterior surface inwards of and slightly above the lower end of the crista. This cavity is not accidental, for it is present in the same position in both bones (fig. 2 of Pl. XVII shows it plainly). The lower end of the crista radialis lies at a distance of 11 cm. from the distal end of the condylus lateralis. The distance between the upper end of the crista and the medial upper corner of the bone is 10 cm. in the left bone and is nearly 12.5 cm. in the right one. It seems as if the dimensions of the left bone are nearer to the original.

The breadth of the shaft at its narrowest place is 2.5 cm. Its thickness there is 3.3 cm. (left bone). The breadth of the distal end is 7.4 cm. in the left and 7 cm. in the right bone. The distal end of both bones (text-fig. 22) is flattened and therefore broader than originally. A rounded ridge runs from the lower end of the crista radialis right to the distal edge of the condylus lateralis. A broad, low ridge passes from the condylus medialis upwards on the shaft and disappears near the middle of the bone. Between these two ridges the anterior surface of the distal end is strongly concave. This concavity becomes narrower and shallower upwards and disappears in the middle of the shaft. The posterior surface of the distal end is concave along its middle, but it seems that this concavity is at least greatly exaggerated by pressure. The condyles are not produced backwards and they stand out slightly anteriorly. The articulation



Text-fig. 22. *Massospondylus Browni*. Left humerus. Outline of distal end seen from below. Anterior border above. Nat. size.

Between these two ridges the anterior surface of the distal end is strongly concave. This concavity becomes narrower and shallower upwards and disappears in the middle of the shaft. The posterior surface of the distal end is concave along its middle, but it seems that this concavity is at least greatly exaggerated by pressure. The condyles are not produced backwards and they stand out slightly anteriorly. The articulation

surface stands at right angles to the axis of the bone. The ulnar condyle is broad and not thick, the radial condyle is narrow and thick. Thickness of the ulnar condyle 2.5 cm., of the radial condyle 3.5 cm. Breadth of the ulnar condyle about 3 cm. and of the radial condyle 1.5 cm., all of the left humerus.

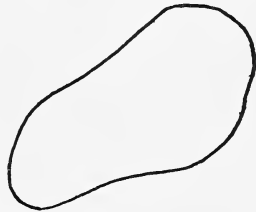
ULNA AND RADIUS.

Both lower arms are present. Ulna and radius of the right arm have suffered badly from pressure. Those of the left arm have also suffered, but they are in better condition than those of the right.

Ulna. The left ulna (Pl. XVIII, figs. 2 and 4) has a length of 14 cm. The postero-medial edge of the bone has a sigmoidal shape, its upper end being convex and its lower end concave inwards and forwards; the antero-lateral edge is proximally concave outwards, in the middle straight or slightly convex and its lower end again concave towards the lateral side. The proximal end is slightly bent forwards and runs out anteriorly into a sharp point. The posterior portion of the proximal end is much higher than the anterior portion, the difference in height being 1.7 cm. This portion is dome-shaped; in front of it lies the concave articulation surface. The antero-medial border of the proximal surface (text-fig. 23) is sigmoidal. Its anterior end is convex; in the middle it is concave and its extreme posterior end is convex. The lateral border of the proximal surface is slightly concave, while the hinder border is convex backwards and upwards. The proximal surface has a triangular shape. The anterior angle is very sharp; the postero-medial angle, formed by the antero-medial border and the hinder border, is also acute, but broadly rounded, while the latero-posterior angle, formed by the posterior and lateral borders, is obtuse. The shaft is concave below the lateral border of the proximal surface. Below the posterior border the surface of the shaft is concave in one bone and convex in the other; it seems that the concavity is wholly due to pressure and that, therefore, the bone was originally convex in this region. In both cases the latero-posterior angle of the proximal surface and the surface of the shaft for a short distance beneath it stand out from the bone backwards and outwards. The antero-medial border of the proximal surface has a length of 5.4 cm., the lateral border a length of 4 cm. and the hinder border a length of 3.2 cm. The thickness of the bone, taken over the latero-posterior angle, is 2.4 cm. The antero-medial surface of the bone is concave from the antero-lateral border to the postero-medial border. Whether this was originally so in the middle of the shaft is not certain. The postero-medial edge of the whole bone is broadly rounded; a large portion of its upper end is rough and served for the attachment of muscles. The upper part of the antero-medial surface is covered with short longitudinal grooves, which probably served for the



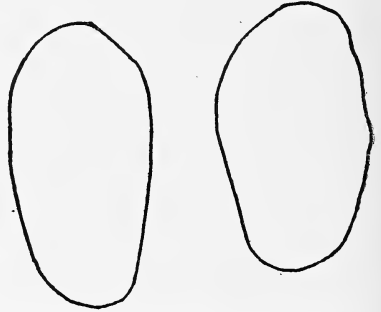
Text-fig. 23. *Massospondylus Browni*. Left ulna. Outline of proximal end seen from above. Anterior end below and antero-medial border to the left. Nat. size.



Text-fig. 24. *Massospondylus Browni*. Left ulna. Outline of distal end seen from below. Medial end to the left, posterior border below. Nat. size.

attachment of ligaments. At its narrowest place the shaft has a breadth of 2.3 cm. and a thickness of 1.2 cm. The distal end (text-fig. 24) has a breadth of 3.7 cm. and a thickness of 1.9 cm. Its anterior end is turned to the lateral side and its posterior end to the medial side. Its long axis makes an angle of about 25° with the long diameter of the proximal end. The distal articulation surface has two facets. The postero-lateral part of the articulation surface passes somewhat upwards on to the shaft. The antero-medial edge of the distal end of the bone has two longitudinal ridges, separated by a groove. The postero-lateral ridge is high, the antero-medial one forms the slightly prominent border of the antero-medial surface.

Radius. The radius (Pl. XVIII, figs. 1 and 3) has a greatest length of 13.3 cm. The antero-lateral edge of the bone has a length of 12.3 cm. The proximal end of the radius is broad and thin (text-fig. 25). Its breadth is 3.6 cm. This was originally a few millimetres more, for the postero-medial corner of the proximal end is broken off. Its thickness is 1.7 cm. The proximal articulation surface is concave from the high posterior end of the antero-medial border to the slightly lower anterior end of the postero-lateral border. The breadth of the shaft at its narrowest place is 1.8 cm. and its thickness 1.3 cm. The distal articulation surface has a length of 3.5 cm. (text-fig. 25) and a breadth of 1.9 cm. The fairly flat surface slopes from the postero-medial corner downwards to the antero-lateral end. Both the antero-lateral and the postero-medial edges are concave, but the antero-lateral one is convex at the distal end. This gives the impression that the distal end is bent slightly backwards and to the medial side. The distal end of the antero-lateral edge bears a sharp ridge, which runs from the articulation surface upwards for a short distance, and which leans forwards. The postero-medial edge of the distal end is fairly sharp.



Text-fig. 25. *Massospondylus Browni*.
Left radius. Outline of proximal
and distal end seen from above
and below respectively. Anterior
border above. Nat. size.

CARPUS.

Two carpalia are preserved in both hands. Those of the right hand, however, are fragmentary. A large flat bone was situated behind the first metacarpale and is apparently the first carpale. A small bone was situated lateral to this one and was evidently displaced. It is most probably the second carpale. Both bones have been completely covered by cartilage.

First carpale (Pl. XVII, fig. 5). The breadth of the bone is 4 cm. This may have been slightly greater, for the extreme upper medial corner is broken off. Its height is 2.5 cm., its medial thickness 1.1 cm. and its lateral thickness 0.8 cm. The medial portion of the anterior surface is convex in its lower half, while its upper half is concave. The lateral portion of the anterior surface is also concave. The two concave surfaces are separated by a rounded ridge. The lateral concave surface occupies about one-third of the anterior surface. The posterior surface is convex. The upper edge of the bone is slightly damaged. The medial edge is thick, and convex forwards, inwards and downwards. The lower edge is broad and in its middle lies a pit, probably for the attachment of a ligament. The lateral edge is thin and projects towards the lateral side in its middle. The upper edge was thin. This bone can be fitted

on to the proximal end of the first metacarpale in such a way that the upper edge of the bone lies at the same level as the upper edge of the proximal articulation surface of the first metacarpale. In this case the lower and the medial edges of the carpale project downwards beyond the lower edge of the articulation surface of the metacarpale. The ridge on the anterior surface of the carpale will then lie on the lateral proximal edge of the metacarpale, so that the whole concave lateral portion of the anterior surface of the carpale projects beyond the lateral side of the metacarpale.

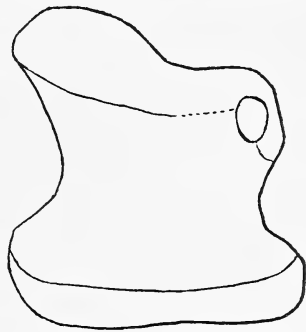
Second carpale (Pl. XVII, fig. 6). The greatest dimension of the bone is 2.5 cm. When fitted in position, this dimension runs from above downwards and inwards. Its breadth is 1.3 cm. Its thickness below is 1 cm. and above it ends in a sharp edge. Its posterior surface is convex and its anterior surface concave. Its nearly square lower surface is flat and has a pit in the middle for the attachment of a ligament.

The second metacarpale fits exactly with its convex posterior surface into the concave lateral portion of the anterior surface of the first metacarpale. Its upper end lies in this case near the lateral production of the lateral border of the first metacarpale, and its lower surface lies practically in the same plane as the lower proximal edge of the first metacarpale. The two ligament pits are then exactly opposite each other. When the second metacarpale is now fitted into place, it will be found that its proximal surface lies practically at the same level as that of the first metacarpale. The second carpale appears to be situated between the second metacarpale and the first carpale, while on its medial side it touches the first metacarpale and on its lateral side would probably touch the third carpale.

HAND.

Both hands are complete, but the left one is much better preserved than the right. The hand will be described as if it were stretched out with the palmar side downwards. Compare also Pl. XVIII, fig. 5, Pl. XIX, fig. 1 and text-figs. 26 and 27.

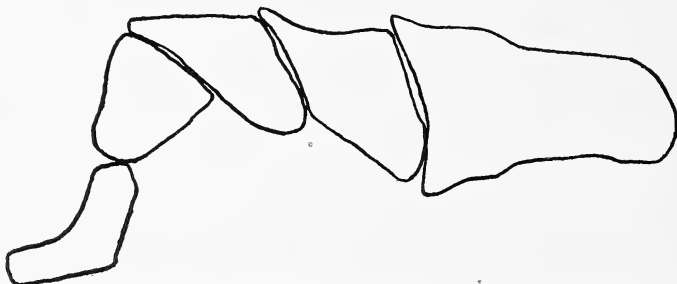
Metacarpale I can easily be recognised from the others by its remarkable shape (text-figs. 26 and 27). The proximal articulation surface has a quadrangular shape. The two lateral corners of this quadrangle are drawn out and far apart, while the two medial corners are rounded and close together. The shaft is very short. Two ridges run towards the distal end from the lateral corners of the proximal end. The ridge starting at the lower lateral corner is sharp and high and ends in the middle of the shaft. The superior lateral ridge is also high and sharp, but it runs right down to the distal end, where it branches around the lateral collateral pit. The lower medial corner of the proximal articulation surface is nearer to the distal end than other parts of the surface. The axis of the distal articulation surface is not parallel with that of the proximal surface. Its lateral end is higher and its medial end lower than in the proximal axis and moreover the lateral end projects much further distally than the medial end. The distal end is therefore twisted to the medial side. The two portions of the distal



Text-fig. 26. *Massospondylus Browni*. Metacarpale I of the left hand. Outline view from above and slightly medial, showing the extent to which it was covered with cartilage. Nat. size.

articulation surface are divided by a groove. The two collateral pits are deep. The articulation surface runs right round on the lower border of the medial collateral pit. The lateral portion is drawn out to a point above the lateral collateral pit and also below it. The lower surface is sharply concave immediately behind the groove dividing the portions of the articulation surface.

Metacarpale II is the longest. Its proximal articulation surface is triangular (text-fig. 27). The whole surface is convex. Laterally it runs out into a narrow strip. This is the proximal face of a very high, thin ridge, which subsides on the shaft before reaching the distal end. A ridge runs from one of the corners of the proximal surface over the upper surface of the bone towards the distal end, and disappears before reaching the middle of the shaft. The lower surface of the proximal end has a broad, low ridge, which starts near the proximal surface and runs towards the middle of the shaft. There is a small concavity on both sides of this ridge. The inferior part of the distal end is much broader than the superior part, for the medial collateral pit opens upwards and inwards. Both collateral pits are deep. A division of the distal articulation surface is only indicated. The articulation surface passes much further on to the lower than on to the upper surface of the bone. The distal end is twisted somewhat to the lateral side.



Text-fig. 27. *Massospondylus Browni*. Left hand. Outline in relative position of proximal ends of metacarpalia. Metacarpale V is deformed and could not be fitted into position. Nat. size.

Metacarpale III. This is shorter and much more slender than II. Its proximal articulation surface is also triangular. The three ridges running from the corners of the proximal surface along the sides and upper surface of the shaft towards the distal end subside in the shaft before reaching its middle. The lateral portion of the lower surface of the proximal end is concave; its narrower medial portion is occupied by a broadly rounded ridge, which subsides in the middle of the shaft. The inferior part of the distal end is broader than the upper part, because both collateral pits open upwards. The articulation surface passes further on to the lower than on to the upper surface of the bone. The distal end is twisted somewhat to the lateral side.

Metacarpale IV is more slender than III. Both its ends are relatively thicker. The proximal end has a triangular shape (text-fig. 27), but the upper angle does not lie in the middle of the upper surface as in the metacarpalia II and III, but on the extreme medial side. The upper angle is a thick rounded knob, which continues on to the shaft for a very short distance only. The lower medial angle is sharp and it sends a very short, sharp ridge forwards. The lateral angle is broadly rounded. The distal end is narrow and thick. The upper and lower breadth is practically the same. The shaft has a tri-

angular section with a vertical medial side. The distal end is slightly twisted to the medial side.

Metacarpale V is different in the two hands, but the left has suffered from pressure and the right has completely escaped this misfortune (text-fig. 27). The proximal end has a triangular shape of the same type as that of metacarpale IV, only narrower and higher. The upper angle, which lies on the extreme medial side of the upper surface, is very broadly rounded. The lateral corner is also very broadly rounded. The lower medial corner is sharp and narrow; between this corner and the upper one lies a concave surface. The proximal articulation surface is greatly convex, except the lower portion, which is concave. The upper corner passes further forward on the shaft than any other portion of the articulation surface. The distal end is convex. Laterally it runs out into a knob-like point; medially it is broadly rounded. A section of the shaft is more or less triangular, with a nearly vertical medial side and a convex lower one. The longest dimension of the distal articulation surface stands from above downwards and inwards. This metacarpale does not possess collateral pits.

Phalanges. The first phalanx of the first digit is a remarkable bone. Its distal end is twisted nearly 45° on its proximal end. The proximal articulation surface has a trapezoidal shape. Its lateral side, however, is convex and its medial side is concave above and convex below. The lower medial corner of the surface is tongue-shaped and projects far to the medial side. The whole surface is deeply convex; it is divided into two unequal portions by a slight ridge; the lateral portion is the larger, the medial portion only consisting of a narrow strip along its concave border and of the tongue-shaped lower corner. The lower border is slightly concave below the end of the groove over the articulation surface. The distal end is pulley-shaped. The groove between the two portions stands obliquely from above downwards and inwards. Its lateral side projects further forwards than its medial side, but the medial portion of the articulation surface passes further backwards on the lower surface than the lateral portion. The lateral collateral pit is deeper than the medial one.

Excepting the claws, the phalanges of the second and third fingers have all the same general shape. The contour of the proximal surface of all these phalanges is trapezoidal. The proximal articulation surface of II, 1 and III, 1 is deeply hollow and not divided by a ridge. The upper posterior end of the phalanges does not project far backwards. The lateral side of their distal end projects further forwards than the medial side. The distal end of II, 1 is twisted to the lateral side, that of III, 1 slightly so. There is a slight concavity behind the anterior articulation surface on the upper surface of the bone. The lateral collateral pit is deeper than the medial one.

As in the foot there is no pit behind the articulation surface on the upper surface of all the penultimate phalanges of the hand. The proximal articulation surface of both penultimate phalanges of the second and third fingers is divided into two portions by a ridge. The lateral portion is broader than the medial one. The penultimate phalanx of the second finger differs from that of the third, except in size, through the upper portion of the medial border of the proximal surface being concave in the former and straight in the latter. A further difference is, that in the penultimate phalanx of the second finger the lateral side of the distal articulation surface passes slightly further downwards than the medial side, whereas in the penultimate phalanx of the third finger this is just the reverse. Both phalanges have a broad and thick upper posterior process. The distal articulation surface of both phalanges passes

much further backwards on the lower than on the upper surface. Their lateral collateral pit is deeper than their medial one.

The second phalanx of the third finger has a divided proximal articulation surface. There is no pit behind the distal articulation surface on the upper surface of the bone, and contrary to the condition in the penultimate phalanges of the second and third fingers, where one side of the distal end does practically not project beyond the other, the lateral side of the distal end of this phalanx projects beyond its medial side. The lateral collateral pit is deeper than the medial one. The lateral portion of the distal articulation surface of II, 1, III, 1 and III, 2 is broader than the medial portion.

The fourth and fifth fingers are remarkable. The fourth has only three phalanges and the fifth only two. The phalanges of both fingers can be recognised by their plainness. None of them has a superior-posterior process. The first phalanx of the fourth finger has an evenly concave proximal articulation surface. The distal articulation surface is evenly convex; there is no pit behind it on the upper surface. The second phalanx has an evenly concave proximal and an evenly convex distal articulation surface. There is no pit on the upper surface. The collateral pits are represented by very slight concavities, bordered below by a knob-like process. The endphalanx of this finger is a remarkable, small, three-edged body. Two of the edges border the very slightly concave articulation surface. The third edge forms the sides and the anterior end of the bone. The first phalanx of the fifth finger has an oval-shaped evenly concave, proximal articulation surface. It stands somewhat obliquely on the axis of the bone, the superior border lying further forwards. The distal articulation surface is evenly convex and its lower lateral side sends a small process backwards below the collateral pit. The endphalanx of the fifth finger has the same general shape as the endphalanx of the fifth digit of the foot. Its proximal articulation surface is oval-shaped and very slightly concave. It stands obliquely on the axis of the bone for its superior edge lies much further forwards than its inferior one. The inner edge of the bone is straight and the outer-anterior one evenly convex from the inner-anterior end to the outer-posterior end. The anterior portion and part of the outer portion of this edge has been covered with cartilage.

The clawphalanx of the first finger is high and strongly curved (Pl. XVII, fig. 4). The groove for the claw lies slightly deeper on the medial than on the lateral side. There is a broad ridge on each side below this groove. The highest part of this ridge on the medial side lies below its middle line, while the highest part of the lateral ridge follows the middle line of the ridge. The proximal ends of both ridges terminate some distance in front of the articulation surface by a low, sharp, curved ridge. The medial ridge passes further backwards than the lateral one. The distal end of the medial ridge lies slightly higher than that of the lateral one. There is a broad thick boss on both sides in front of the middle of the articulation surface. The boss on the lateral side is thicker and is situated higher up the side of the bone than the medial one. The bosses are separated from the just mentioned ridges on their respective sides by a broad groove. These grooves pass downwards and backwards above the boss for the flexor tendon, where they become deep and narrow, and continuing come very near to each other behind it. Upwards they are continuous with the grooves for the claw. The tuberositas for the flexor tendon is divided into two portions by a longitudinal groove, which lies to the lateral side of the middle line on the lower surface. The lateral portion of the tuberositas, which lies higher on the lateral side than the inner portion on the medial one, is high and narrow, while the inner portion is low and broad. As in all these

clawphalanges, the articulation surface is divided by a vertical ridge into two parts, of which in this case the medial one is slightly broader in its lower end than the lateral one. Through the position of the distal articulation surface of the preceding phalanx, the clawphalanx must lie obliquely from above downwards and inwards. The clawphalanges of the second and third fingers are much less curved. The lateral groove for the claw is slightly higher than the medial one, although the difference in height is scarcely noticeable in the third clawphalanx.

Measurements of metacarpalia and phalanges of the left hand in centimetres (for the fifth metacarpale those of the right hand have been substituted):

	Length	PROXIMAL		DISTAL		
		Breadth	Thickness	Breadth		Thickness
				inf.	sup.	
I	4.2	3.4	2.4	3.4	3.3	1.7
I, 1	3.5	3.2	2.7	2.2	1.2	2.1
I, 2	6.3	1.6	3.4	—	—	—
II	5.6	3.2	1.6	2.6	1.7	1.8
II, 1	2.8	2.5	2	2.1	1.4	1.6
II, 2	2.7	1.9	1.9	1.7	1	1.6
II, 3	4.6	1.3	2	—	—	—
III	5.1	2.6	1.2	2	1.3	1.2
III, 1	2.3	1.9	1.4	1.8	1.2	1.1
III, 2	1.9	1.6	1.5	1.6	1.1	1.1
III, 3	1.8	1.4	1.3	1.3	0.8	1
III, 4	3.1	1.4	1	—	—	—
IV	4.3	1.8	1.6	1.5	1.3	1.1
IV, 1	1.8	1.4	1	1.2	1	0.9
IV, 2	1.2	0.9	0.9	1	0.6	0.6
IV, 3	0.6	0.7	0.5	—	—	—
V	2.8	1.7	1.6	—	1.5	1
V, 1	1.6	1.3	0.8	—	1	0.6
V, 2	1	0.7	0.5	—	—	0.3

A few millimetres are missing from the extreme end of the clawphalanx of the first finger. The length of its lower surface has been taken for the length of the ultimate phalanx of the fourth finger.

ILEUM.

Both ilea are preserved, but they have suffered greatly from pressure. The ileum is a broad plate with a short spina anterior and a long spina posterior (Pl. XIX, fig. 2). The acetabulum cuts deep into the bone and is bordered in front by a long processus praeacetabularis and behind by a short processus postacetabularis. The upper portion of the ileum is thin, the lower portion thicker. Both spina anterior and posterior are directed outwards and the outer surface of the bone is therefore concave. The length of the bone from the spina iliaca anterior to the spina posterior is 19.9 cm. in the left and nearly 21 cm. in the right ileum. The upper border, which is damaged, is convex. The outer surface of both spinae and of the upper border as far as preserved is coarse, and has apparently served for the attachment of muscles. This coarse surface is especially large on the spina posterior. The hinder end of the spina posterior is truncated. Nothing can be said of the medial surface of the bone, for in both cases it is covered by matrix and other bone material, which could not be removed. The height of the ileum, from the processus

postacetabularis to the upper border, is 13 cm. in the left and 13.5 cm. in the right ileum. The acetabular notch has a depth of 5 cm. and a breadth of 10 cm. in the left ileum. The crista supra-acetabularis projects to the lateral side as a sharp, thin ridge from the proximal two-thirds of the processus praeacetabularis. Probably it continued right down to the distal end of the processus praeacetabularis. This ridge becomes thicker and lower on the iliac plate, where it dies out before reaching the processus postacetabularis. The acetabular surface has a breadth of 3 cm. in the left ileum and of 4 cm. in the right one. It is concave in all directions. The inner border of the acetabular surface is a sharp ridge. The processus praeacetabularis reaches further forwards than the spina iliaca anterior. There is a deep notch between the two, which is much wider in the right than in the left ileum, probably a result of pressure. The length of the processus praeacetabularis is 9.5 cm. There are two sacral ribs (?) on the medial side of the right ileum. The posterior one is situated on the hinder border of the bone, and both have been pressed into the bony matter of the ileum. They are just where one expects the crista medialis. The acetabulum of the left ileum gives one the impression that in the natural position of the bone the end of the spina iliaca anterior was situated nearly perpendicularly above the head of the femur.

PUBIS.

Both pubes are present, but in a very bad condition. The distal portion of the right pubis is missing. The processus subacetabularis and the downward bent portion at the upper inner corner of the pubic plate of both pubes are missing (Pl. XIX, fig. 3). When found the pubes were lying parallel and near to each other, but there was no bony connection between the pubic plates. However, it seems not improbable that the pubic plates were originally coalesced. The medial borders of both plates are fractured over their whole length. Although very much flattened, the right pubis still shows that the neck has an anterior and a medial surface, which round off broadly into each other. The lateral posterior surface of the neck is convex. The inner border of the neck is sharp. The shape of the neck is, therefore, essentially the same as that of the pubis of *Dromicosaurus gracilis*. The length of the right pubis as preserved is 28 cm. The breadth of the pubic plate in the middle, as preserved, is more than 4 cm.

ISCHIUM.

The proximal portions of both ischia are present. They are completely flattened out and so crushed generally, that it will suffice to figure them (Pl. XIX, fig. 4). It seems, however, that the articulatio iliaca made a much larger angle with the general long axis of the bone than in *Dromicosaurus gracilis*.

FEMUR.

Both femora are present, but they are badly crushed. The left femur (Pl. XX, figs. 1 and 2) was broken in several places, but the pieces were fitted together and joined with plaster of Paris by myself; these fractures have had no influence on the length of the bone. Both bones are curved sigmoidally, concave above and convex below towards the front. Most of the curvature, however, has been crushed out of the right femur. The length of both femora is 35 cm. The breadth of the proximal end, measured from the tip of the caput femoris to the lateral side, is 10 cm. in the left and 9.5 cm. in the right femur. These measurements are of course very much exaggerated through the crushing of the bone. The original breadth can easily have been 1 cm. less. The caput femoris is directed inwards; as preserved its height is about 4 cm. and its

breadth about 2 cm.; originally the breadth may have been greater than the height. The proximal surface is convex and forms an angle with the lateral side. The trochanter minor lies on the hinder surface at the border of the proximal surface and nearer to the medial end of the caput femoris than to the lateral side of the bone. The upper end of the trochanter major is broken off in both bones. It was situated at a distance of 6.2 cm. from the proximal end in the left femur; this distance is 5.5 cm. in the right bone. There is a broad, deep groove between the lateral side of the trochanter and the general surface of the bone. The height of the trochanter, as preserved in the left femur, is 9 cm. The lower end of the trochanter is not visible. Between its proximal end and the trochanter major the femur was broader and thinner than further downwards. Both bones are so badly crushed that nothing can be seen of the ridge, which in other femora runs from the trochanter major towards the condylus medialis. The lateral side of the proximal end is slightly convex and the medial side concave. Therefore the proximal end of the femur is slightly bent inwards.

The trochanter quartus begins at a distance of 9 cm. from the proximal end in the right femur. This distance is 10 cm. in the left one. It terminates at a distance of 15.5 cm. in the right and 16.5 cm. in the left femur from the proximal end of the bone. This lower end lies at a distance of 18.5 cm. in the left and 19.5 cm. in the right bone from the distal end. The height of the trochanter is 2 cm. Its medial side is steep and its lateral side less so. The proximal end of the trochanter forms a very pronounced ridge; a second ridge, medial to this first one, is only indicated by a slightly greater convexity of the lateral side of the trochanter. The trochanter is situated nearer to the medial than to the lateral side of the bone. Its lateral side is convex and its medial side concave. The fossa intercondyloidea begins at about 11 cm. above the distal end. Its upper end lies nearer to the medial than to the lateral side of the bone, and its lower end is slightly further away from the medial side. The condylus medialis has a breadth of 2.8 cm. in the left femur and a breadth of 2.4 cm. in the right one. In the right femur the condyles have been pressed very much to the medial side and flattened; in the left one they have been slightly pressed to the lateral side. The height of the condylus medialis is 3.8 cm. It projects about 3 cm. from the bottom of the fossa intercondyloidea. The condylus lateralis has a breadth of 2.4 cm. in the right femur. Its height is about 3.5 cm. and it projects about 2.5 cm. from the bottom of the fossa intercondyloidea. The breadth of the distal end of the bone is about 9 cm. in both femora. The distal articulation surface stands obliquely on the axis of the bone, that is to say, if this surface is placed horizontally, then the axis of the bone is directed from below upwards and backwards. The anterior surface of the lower end is slightly concave. The lateral surface is hollow and the condylus lateralis stands out slightly to the lateral side.

TIBIA.

Both tibiae are preserved, but in a very bad condition. The proximal end of the right tibia (Pl. XX, fig. 3) is distorted and that of the left flattened to less than finger thickness. As preserved, the length of the bone is 30.5 cm. The head of the left tibia has now attained a length of about 12 cm. and a thickness of 1.3 cm. at its anterior end and of 3 cm. at its posterior end. The head of the right tibia has a length of 8.5 cm. measured from the hinder end of the condylus lateralis (!) to the anterior portion of the medial border. Its breadth is 5 cm. I give these measurements, which are of no value to our knowledge of the animal they belong to, for reasons which will be discussed

hereafter. The tuberositas tibiae of the right tibia is still visible. The lateral condylus of the right tibia is flattened and now forms a kind of lateral posterior process. The concave portion in the lateral border of the proximal articulation surface is slightly deepened, but the notch in the hinder border has been greatly exaggerated through pressure. The articulation surface slopes from behind upwards and forwards. The shaft becomes narrower from the head downwards. The distal end is transversely broad; the bones are so badly crushed that it is useless to say more about them. As far as can be made out, they have the same general shape as other *Theropod* tibiae.

FIBULA.

Of the left fibula only the proximal end is present. The right fibula is complete, but has suffered much from pressure. The original curvature of the bone is completely flattened out. The fibula has the same general shape as the fibula of *Dromicosaurus gracilis*. Its length is 30 cm. The high ridge on the shaft of the fibula of *Dromicosaurus gracilis* is still visible in this specimen as a faint low ridge. The antero-medial corner of the distal end is broken off. The fibula is figured in fig. 4 of Pl. XX.

TARSALIA.

Fragments of the tarsalia of the left and the right side are present, but they are too badly preserved to study in detail.

FOOT.

The right foot is complete (Pl. XXI, fig. 1 and Pl. XXII), and of the left foot the first two toes are present. All the bones, and especially the metatarsalia, have suffered from pressure.

Metatarsale I has a length of 9.3 cm. in the right and 9.6 cm. in the left foot. The bone of the right foot is more flattened than that of the left. As preserved the proximal breadth of the right bone is 4 cm. and that of the left 3.6 cm. The thickness of this end is 1.2 cm. and 1.3 cm. respectively. Posteriorly the proximal end of the bone has a broad rough edge, which passes further downwards into the smooth posterior surface of the shaft. There is a slight angle between the rough and the smooth edge. Proximally the lateral surface bends towards the medial side near the posterior border. Nothing is visible of a ridge on the medial side of the proximal end, but this may be due to pressure. The shaft narrows down to a breadth of 2 cm. and 2.4 cm. and a thickness of 1.5 cm. and 1.1 cm. in the left and right bones respectively. The axis of the distal articulation surface stands obliquely on the axis of the bone; the medial posterior end of the surface is much higher than the lateral anterior end. Further the axis is directed from the front backwards and somewhat to the medial side. The antero-medial part of the articulation surface is undivided. Below and behind it consists clearly of two portions, a large, globose, antero-lateral one and a narrow, transversely elongated, medial portion, which sends a long narrow process upwards, backwards and to the lateral side. There is a deep concavity between the globose portion of the articulation surface and its hook-like process on the postero-lateral surface of the bone. On the under surface the two portions of the articulation surface are divided by a very shallow, broad groove.

Metatarsale II has a length of 14 cm. The proximal articulation surface has the shape of a quadrangle. All four sides of this quadrangle are concave. The deformation makes it impossible to say which side of the bone is more concave than the other. The lateral border of the proximal surface has a length

of 3.6 cm., the medial border a length of 3.9 cm., the posterior border a length of 3.1 cm. to 3.3 cm. and the anterior border a length of 2.6 cm. Ridges run from the corners of the proximal surface downwards on to the shaft. The upper end of the antero-lateral ridge is very thin and sharp; the antero-medial ridge is rounded; the two posterior ridges stand out prominently but are deformed. All these ridges submerge into the rounded edges of the shaft. There is a small tuberositas on the lateral border of the anterior surface near the middle of the shaft. At its narrowest part the shaft has a breadth of 2.5 cm. and 2.3 cm. and a thickness of 1.5 cm. and 1.7 cm. in the right and left bones respectively. The distal articulation surface does not stand at right angles to the shaft, its medial end being higher than its lateral end. As preserved, the breadth of the distal end of the right bone is 3.8 cm., its lateral thickness 1.6 cm. and its thickness at the medial side 2.2 cm. The medial thickness of the distal end of the left bone is 2.5 cm. The articulation surface passes higher up on the medial side of the anterior surface of the bone than on the lateral side. Posteriorly the medial side of the distal end has a backwardly directed process, the lower surface of which is a backwardly directed process of the articulation surface. The middle of the posterior surface of the distal end is slightly concave. The greatly elongated lateral collateral pit is much deeper than the medial one. The anterior surface of the distal end is smooth.

Metatarsale III has a length of 15.5 cm. The proximal articulation surface has a triangular shape. The bone is very much flattened, but as preserved, the hinder angle lies towards the medial side. The two anterior angles lie close together. As the medial anterior ridge is broken off the lengths of the medial and anterior borders of the proximal surface cannot be given, but as preserved they are each approximately 2.5 cm. The lateral border has a length of 4.7 cm. The two medial ridges converge downwards and subside into the medial side of the shaft. At this point the medial side of the shaft is slightly convex. The lateral side of the shaft shows a small tuberositas a short distance above this medial convexity. The lateral ridge disappears earlier into the lateral side of the shaft. At its narrowest part the shaft has a breadth of 2.3 cm. and a thickness of 1.3 cm. The axis of the distal articulation surface does not stand at right angles to the shaft, its medial end being higher than its lateral end. The breadth of the distal end is 3.6 cm., its lateral thickness 1.7 cm. and its medial thickness 1.9 cm. The middle of the posterior surface of the distal end is concave. Posteriorly the medial side of the distal end has a backwardly directed process, the lower surface of which forms a backward prolongation of the articulation surface. The anterior surface of the distal end shows a peculiar feature. The centre above the articulation surface is convex. Around and above this convexity there is a half-moon shaped concavity. Above this is the flat anterior surface of the shaft. Both collateral pits are deep, but the lateral one is deeper.

Metatarsale IV has a length of 14 cm. As preserved the proximal portion is very thin; its anterior surface is convex and its posterior surface is concave. Its greatest thickness here is 1.1 cm. and its breadth 6 cm. The bone has suffered greatly from pressure and is quite out of shape. A ridge runs down its anterior surface and starting near the middle of the upper end reaches the medial side above the middle of the shaft. At this point it forms an elongated knob on the side of the shaft. At its narrowest part the shaft has a breadth of 2.4 cm. and a thickness of 1 cm. The lateral end of the distal articulation surface is situated much higher than the medial end. Anteriorly the breadth of the articulation surface is 2.5 cm., posteriorly it is 3.1 cm. The reason of

this difference is, that the hinder border of the lateral collateral pit stands out very far laterally. There is no medial collateral pit, the medial surface of the distal end being evenly concave. Posteriorly the medial side of the distal end forms a sharp ridge, the lower surface of which joins up with the articulation surface. The posterior surface of the distal end is concave along its middle.

Metatarsale V. A small piece of the distal end of metatarsale V is broken off. As preserved the whole length of the bone is 7 cm. The whole length may have been 7.5 cm. Proximally the bone is very broad and thin. Its breadth here is 4.3 cm. Laterally the thickness of the proximal end is 1.5 cm., but towards the medial side it rapidly thins down to 0.7 cm. Its medial edge is sharp. The medial end of the upper border of this thin portion is bent slightly backwards; the medial border runs downwards, forwards and outwards. The anterior surface is convex, the posterior concave. The hinder lateral ridge is sharp and runs downwards and to the medial side. At the lower end of this ridge the bone has a breadth of 1.5 cm. and a thickness of 1.3 cm. A broad low ridge starts at this spot on the lateral surface and runs downwards and forwards.

All the phalanges have been preserved. In the following table their measurements are given in centimetres:

	Length	PROXIMAL		DISTAL		
		Breadth	Thickness	Breadth		Thickness
				ant.	post.	
I, 1	5	3.4	2.3	1.5	2.8	2.1
I, 2	7.8	2.2	3.4	—	—	—
II, 1	6	3.3	2.4	2.6	3.4	1.9
II, 2	4	2.9	2.3	1.7	2.5	1.9
II, 3	±6.8	1.8	2.8	—	—	—
III, 1	6	3.7	2.1	2.5	3.3	1.7
III, 2	4.3	3	2	2	2.8	1.6
III, 3	3.5	2.6	1.8	1.5	2.3	1.6
III, 4	—	2.1	2	—	—	—
IV, 1	4.6	3.2	1.8	2	3	1.5
IV, 2	3.5	2.8	1.8	1.8	2.7	1.4
IV, 3	3	2.6	1.7	1.6	2.4	1.4
IV, 4	2.7	2.2	1.6	1.2	2.1	1.3
IV, 5	5.1	1.7	1.8	—	—	—
V, 1	1.8	1.5	0.8	—	—	0.5

Remarks. The anterior breadth of the distal end has been measured across the upper anterior boundary of the articulation surface. The first phalanges can be recognised by the fact that their proximal articulation surfaces are evenly concave and that the hinder border of this surface is straight, at all events not projecting upwards in the centre. All the penultimate phalanges have in common that the distal ends of their anterior surfaces are evenly concave and not pitted. These two characters, therefore, separate I, 1 from all other phalanges. Moreover the distal end of I, 1 is twisted slightly to the lateral side. The posterior border of the proximal articulation surface is higher than the anterior one. The distal articulation surface is unsymmetrical and the articulation ridges of this end run much further upwards on the posterior than on the anterior surface.

The proximal articulation surface of the second, third and fourth phalanges and claws is divided into two parts by a ridge and corresponds with

the pulley-shaped articulation surface of the preceding phalanx. The middle of both its anterior and its posterior border projects upwards, however anteriorly more strongly than posteriorly. This anterior upper process is strongest in II, 2. The first claw is more bent than the others. All the clawphalanges are unsymmetrical. The medial portion of the articulation surface of clawphalanges I, II and III is smaller than the lateral portion. In clawphalanx IV I could see no difference in size. Clawphalanges I, II and III hang over towards the lateral side. Clawphalanx IV hangs slightly over towards the medial side. In clawphalanges I and II the edge between the lateral surface and the lower surface is rounded, while the edge between the medial surface and the lower surface is a sharp ridge. In clawphalanx III both edges are sharp, although the medial edge is sharper. In clawphalanx IV the edges are narrow rounded ridges, the one exactly like the other. In clawphalanges I—III the groove for the claw lies deeper on the medial than on the lateral side. In clawphalanx IV the medial groove may be very slightly higher than the lateral one.

The phalanx of the fifth toe has a remarkable shape. It is a flat bone, the shape of which is generally triangular. What is probably the proximal end has a breadth of 1.6 cm. and a thickness of 0.9 cm. What is probably its medial side has a length of 1.8 cm. and is concave. If this is the right position of the bone, which I do not doubt, for the endphalanx of the fifth finger has this position and has the same general shape as the present bone, the anterior and lateral sides form an evenly convex border. The antero-lateral surface is smooth and gives the impression of having been covered with cartilage. Its posterior border goes slightly further down than its anterior border. The anterior and posterior surfaces of the bone are concave.

DISCUSSION.

While comparing the bones of the lower arm with those of the *Plateosauridae* as described by v. HUENE (5), it was found that there were certain differences which required an explanation. There is one point which can be decided without difficulty and that is, which of the three angles of the triangular head of the ulna is the anterior one. The articulation surface is of course anterior to the high olecranon-like process and the angle below it must be the anterior angle. This angle lies between the two long sides of the triangle. If the ulna of both arms of our specimen is placed with the anterior angle forwards, it will be found that the longest side of the triangular head lies on the medial side. According to description with text-figure of ulna and radius of *Plateosaurus Reinigeri* v. HUENE it seems to be different at least in this species. Here the longest side of the triangular head lies on the lateral (antero-lateral) side of the bone, and the angle between the two long sides of the triangle lies on the lateral side. The figured right ulna of *Plateosaurus Reinigeri* would have to turn 90° on its axis to place the narrow angle of its upper end in front of the remainder of the head. If the narrow angle of the ulnar head of *Plateosaurus Reinigeri* were pointing forwards, its contour would be placed in the same position as the contour of the head of our right ulna and one would therefore conclude that the described ulna of *Plateosaurus Reinigeri* is also a right one, which it actually is.

Let us now compare the ulna of our form with the description and text-figures of the ulna of *Plateosaurus Quenstedti* v. HUENE. In the text (*l. c.* p. 36) it is stated that the anterior angle lies between a lateral side (the longest) of 9 cm. length and a medial side of 7 cm. length. The posterior side has a length of 6 cm. An upper view is given of the left ulna in the text-figure. Its

anterior angle is therein directed downwards, the upper horizontal border is the posterior side, while the long lateral side of the head lies on the right-hand side of the figure. If an upper view of our left ulna is placed alongside of this text-figure, it will be seen that while the anterior angle is directed downwards and the hinder border lies away from the reader, the longest border is situated on the left-hand side of the figure. However, if an upper view of the right ulna of our specimen be placed alongside of the upper view of the left ulna of *Plateosaurus Quenstedti*, it will be seen that the two figures are identical. Moreover, in an adjoining text-figure the lateral side is shown of the left ulna. This lateral side is identical with the medial side of our right ulna. These considerations would lead to the conclusion that, what is supposed to be the left ulna of *Plateosaurus Quenstedti* is really the right one. With the ulna of *Plateosaurus erlenbergiensis* v. HUENE it is the same thing. What is described as the head of the left ulna corresponds with the head of our right one. What is called the right ulna of *Pachysaurus ajax* v. HUENE on p. 143, *l.c.* would be the left one according to our specimen.

From the above may be concluded that the shape of the head of the right ulna of *Plateosaurus Reimigeri* is not identical with the contour of any of the mentioned right ulnar heads; that it would be identical with the contour of the right ulnar head of our form if it were turned 90° on its axis; that the contour of the left ulnar heads of *Plateosaurus Quenstedti*, *Plateosaurus erlenbergiensis* and *Pachysaurus ajax* is identical with that of the right side of our form.

On p. 59 *l.c.* v. HUENE gives a figure and a description of the left radius of *Plateosaurus erlenbergiensis*; the figure presents a medial view. The anterior portion of the medial border of the proximal end and the posterior portion of its lateral border are shown to be high. A medial view of the left radius of our specimen shows the posterior part of the medial border and the anterior part of the lateral border to be high. The contour of a reflected image of the lateral side of our left radius is, however, identical with the contour of the medial side of the left radius of *Plateosaurus erlenbergiensis*; or, in other words, the contour figure of the medial side of the left radius of *Plateosaurus erlenbergiensis* is identical with the contour of a lateral view of our right radius. These considerations would therefore lead to the conclusion, that what is styled left radius of *Plateosaurus erlenbergiensis* is really the right one.

Dr BROOM gave a figure of the left ulna of *Massospondylus Harriesi* (7, Pl. XVI, fig. 15) and it clearly shows that the long side of the triangular head lies medial, while the angle between the two short sides lies on the lateral side. This is therefore in full agreement with the ulnae in our specimen.

I would like to point out that our specimen was taken out of the matrix by myself and that no interchanging of bones could have taken place. The left arm was out of the matrix and every bone labelled and packed away long before the right arm was discovered. Moreover, weathering agencies have had a different effect on the two arms, all the bones of the left arm now having a reddish colour, while all those of the right arm are white. Besides, the bones of the left arm have only suffered slightly from pressure, while nearly all the bones of the right arm are badly crushed. Therefore, even apart from my statement, there is every reason to believe that the bones did not get mixed up.

I have given the measurements of the heads of the tibiae, because I would like to prove the folly of describing fragments in such a crushed and flattened condition under new generic and specific names. If the heads of the above described tibiae had been found separate one could never have proven them to belong to the same nor to different species. However, for example *Euskele-*

saurus capensis LYDEKKER sp. is based on a fragment of a tibia, which is crushed and flattened out of recognition. Nobody will ever be able to prove that this species differs from *Euskelesaurus Browni*. The only result of such work can be, that science is for ever burdened by meaningless names and synonyms.

With regard to the affinities of this specimen, it will be clear from the different ilea that it does not belong to *Gryponyx*.

Comparison with *Massospondylus carinatus* shows immediately that its ileum has practically the same shape as that of our form. Length and height of the bone in our form are 20 cm. and 13 cm. and in *Massospondylus carinatus* 22 cm. and about 14 cm. The relations in the two bones are therefore also practically the same. Our individual may, however, have been slightly smaller. Pubis and ischium of our specimen are too much damaged to allow of comparison with those bones of *Massospondylus carinatus*. The femur portion below the trochanter quartus in *Massospondylus carinatus* measures about 22 cm. and the distance of its trochanter major below the proximal end is 9 cm. In the femur of our specimen these distances are 18.5 cm. and 6.2 cm. Relatively, therefore, the trochanter major lies considerably higher in our form than in *Massospondylus carinatus*. The tibia of the present specimen is too much crushed to be used in a comparison. The humerus of *Massospondylus carinatus* is only known from fragments, and radius and ulna are altogether unknown. Metacarpale I of *Massospondylus carinatus* is relatively slightly broader than that of our form. The first phalanx of the second finger is proportionately longer than in our form and the fifth metacarpale is proportionately broader. The first phalanx of the second toe of *Massospondylus carinatus* has the same length as that of our form but is much broader.

Comparison with *Massospondylus Harriesi* (7, p. 299). The humerus of this type seems to be slightly longer than that of our specimen. At any rate, the distance from the lower end of the pectoral ridge to the furthest part of the distal end is 12.5 cm. in *Massospondylus Harriesi*, whereas it is 11.5 cm. in our form (11 cm. up to the distal end of the condylus lateralis). Radius and ulna of *Massospondylus Harriesi*, however, are both slightly shorter than in our form. The first metacarpale of our form is absolutely longer and narrower than that of *Massospondylus Harriesi*. In *Massospondylus Harriesi* the first phalanx of the first digit is longer than its metacarpale, in our form this is the reverse. The first claw of *Massospondylus Harriesi* is longer than that of our form. There are numerous small differences in the other phalanges of the hand. The distal portion of the femur of *Massospondylus Harriesi*, measured from the lower end of the trochanter quartus, is 15.5 cm. In our form this portion measures 18.5 cm. The metatarsalia of *Massospondylus Harriesi* are all shorter than those of the present specimen, but where metatarsale I is more than 6 mm. shorter, metatarsale II is only 2 mm. and metatarsale III only 1 mm. shorter. The relations are therefore different. All the phalanges of the foot of our form are longer than those of *Massospondylus Harriesi*, but also relatively more slender.

The relations of the humerus of *Aetonyx palustris* are practically the same as in our form, but the radius is relatively smaller. Relative to the first metacarpale, the first claw of *Aetonyx palustris* is much longer than in our form (the distal width of the first metacarpale as given by BROOM (7, p. 305, Pl. XV, fig. 12)). In *Aetonyx palustris* the first metacarpale is practically as broad as long; in our form the breadth is much less than the length. In *Aetonyx palustris* the second phalanx of the second finger is longer than the first and the third phalanx of the third finger is longer than the second.

In our form this is the reverse. Similar differences can be found in the foot.

The lengths of the metatarsalia of *Thecodontosaurus skirtopodus* show relations to each other which differ from those of our form.

Only the femora are known of *Thecodontosaurus Browni*. If the femur of *Thecodontosaurus Browni* and that of the present specimen are given the same length as that of *Dromicosaurus*, and the lower end of the femur of *Massospondylus carinatus* be given the same length as the lower end of the *Dromicosaurus* femur, then the other measurements become as tabulated below (in centimetres):

	Length	Proximal end to trochanter major	Proximal end to lower end trochanter IV	Lower end trochanter IV to distal end
<i>Dromicosaurus gracilis</i>	49.5	7.5	21.5	28
<i>Thecodontosaurus Browni</i>	49.5	8.25	22.7	26.8
Present specimen	49.5	8.77	23.34	26.16
<i>Massospondylus carinatus</i>	—	11.5	—	28

These measurements show that there is a fairly big difference between the femora of *Dromicosaurus gracilis* and of *Thecodontosaurus Browni*, and also between those of our present specimen and of *Massospondylus carinatus*. The difference, however, between the femur of *Thecodontosaurus Browni* and that of the present form is very slight. The difference is so slight that, together with the consideration that our specimen is badly preserved, I do not feel myself justified in ascribing them to different species.

The genus to which they belong cannot be *Dromicosaurus*. Except the difference in the femora, there is a great difference in the relation of femur and tibia. The tibia is relatively much longer, with regard to the femur, in the present form than in *Dromicosaurus*. As preserved, the articulatio iliaca of the ischium of the present form makes a much larger angle with the general long axis of the bone than that of *Dromicosaurus*. It is difficult to conceive that this could be the result of pressure alone. The proximal hollow surface between the articulatio iliaca and the articulatio ischio-pubica seems to be relatively larger in *Dromicosaurus*. Could the required genus be *Massospondylus*? It is difficult to say. The ileum of *Massospondylus carinatus* is practically the same as in the present form, but the trochanter major lies relatively so much lower in *Massospondylus carinatus*. However, this is the only principal difference which I could find. Considering the bad condition of the present specimen I think it will be better to place it in the genus *Massospondylus* and keep it there till it can be definitely proven to belong somewhere else.

Some time ago our collector at Harrismith found some *Dinosaurian* remains on the commonage. They consist of a vertebra and some phalangeal bones, and although they could not be identified as to genus or species, they are here described because they are so well preserved and because the vertebra shows a remarkable vertical ridge, running upwards from the articulation surface for the capitulum costae. There is no indication whatever that these bones belong to one individual.

VERTEBRA.

The vertebra is the first dorsal (Pl. XXIII). The length of its centrum near the neural suture is 7.2 cm. The distance between the lower ends of the articulation surfaces is 7.7 cm. The height of the anterior articulation surface 6.7 cm. and its breadth is about 5 cm. The height of the posterior articulation surface is 6.2 cm. and its breadth 5.4 cm. The centrum possesses a tremendously narrow keel, the lower border of which is nearly straight. The articulation surface for the capitulum costae lies slightly in front of the middle of the centrum and borders on the centro-neural suture. It also lies nearly straight below the large concavity under the processus transversus. It is a deeply concave surface, which is bordered by a high wall, and which is open behind. Its hinder margin, however, lies higher than the nearest surface of the centrum and is therefore a ridge. This ridge continues upwards and through its sigmoidal shape its upper end lies straight above the middle of the parapophysis. Here it is prominent, but its height diminishes as it continues until it disappears well between the two downward ridges from the processus transversus and nearer to the anterior than to the posterior one. There is a small knob immediately below the parapophysis. Both transverse processes have been broken off, the left one near its origin, and the right one in such a way that the hinder border of its distal end is still preserved. The processus is directed slightly backwards and what is left of its upper surface slopes outwards and slightly upwards. The processus is supported below by two ridges, which diverge downwards under an acute angle. The outer edge of the posterior ridge is thicker and stands further outwards than that of the anterior ridge. The distal end of the processus may have been triangular and is much thicker than its proximal end. The lower angle of this triangle is prolonged into a small, downwardly directed knob. The spaces between the processus transversus and the zygapophyses are roofed in by a thin sheet of bone. The space between the supporting ridges of the processus and these bony roofs is occupied by deep pits, the hinder one of which is deeper than the anterior one. The whole upper surface of these bony roofs and of the processus transversus, which is flat as far as preserved, slopes forwards and downwards. There are also supporting ridges below the zygapophyses. All the supporting ridges of one side form together the letter W. The praezygapophyses are broken off. The postzygapophyses project beyond the articulation surface of the centrum. Their articulation surfaces converge downwards under an acute angle. There is a deep groove between the postzygapophyses which runs forwards and cuts into the hinder edge of the processus spinosus. The processus spinosus is very narrow and thick; its upper end is damaged. Both articulation surfaces of the centrum are concave, however, the hinder one more so than the anterior one. The neural canal has an anterior height of 2.1 cm. and breadth of 2.6 cm. and a posterior height of 2.4 cm. and breadth of 1.9 cm. In the middle its height is about 4.5 cm. and its breadth about 1.9 cm.

Foot.

There is a proximal end of metatarsale III. The proximal surface is slightly concave. The anterior border is broken off. The medial border is fairly straight and slightly convex in its hinder portion. Length of medial border 5.2 cm., of anterior border 3.2 cm. and of lateral border probably about 4.5 cm. Length of whole piece 5 cm.

The first phalanx of the first left toe. The bone has apparently not suffered from pressure. Length 5.8 cm., proximal breadth 3.5 cm., proximal thickness

3.2 cm., distal posterior breadth 2.8 cm., distal anterior breadth 1.6 cm., distal thickness 2.4 cm. The contour of the proximal articulation surface is trapezoidal. The posterior border is much higher than the anterior one. The lateral side of the articulation surface is deeper than the medial side. The distal end is greatly twisted to the medial side. The contour of the distal end is also trapezoidal. It is not symmetrical. The articulation surface passes higher upwards posteriorly than anteriorly and its medial side projects further backwards. The collateral pits are large.

Another phalanx is the first of the second right toe. It is a first phalanx because of its evenly concave proximal articulation surface. It is one of the right side because the lateral portion of its distal articulation surface projects further downwards. It cannot be the first phalanx of the first toe, because of the pit on the distal end of the anterior surface and because of the depth of this pit and the thickness of the proximal end as compared with the proximal breadth. I take it to be the first phalanx of the second toe. Length 5.5 cm., proximal breadth 3.7 cm., proximal thickness 3.5 cm., distal posterior breadth 3.4 cm., distal anterior breadth 2.4 cm. and distal thickness 2.5 cm. The axis of the practically cylindrical proximal articulation surface is not parallel with the hinder border of this surface, but converges with it towards the lateral side. This means that the bone is slightly turned to the medial side, when it occupies its natural position. The medial portion of the pulley-shaped distal articulation surface projects further backwards than the lateral portion.

RESULTS.

The main results from the preceding work are here enumerated:

1. Two new genera of the *Theropoda* have been described.
2. Another form has been doubtfully referred to a very little known species.
3. A redescription is given of *Gryponyx transvaalensis* BROOM.
4. A remarkable difference has been found between the pubic neck of the *Plateosaurid* *Eucnemesaurus* and that of the *Anchisaurid* *Dromicosaurus*. It could not be ascertained whether this difference is of family value.
5. The femur of *Eucnemesaurus* disproves the generality of the rule that *Theropod* limb-bones are hollow. Perhaps this rule should be restricted to *Anchisaurids*.
6. v. HUENE draws attention to the peculiar shape of the distal end of the tibia of *Euskelesaurus* and of *Gresslyosaurus*. Both these tibiae differ from all other *Theropoda*. It has now been shown that the published figures of the tibia of *Gresslyosaurus* agree with the tibia of all other *Theropoda*, but disagree with the accompanying description.
7. The *Anchisaurid* *Dromicosaurus* is shown to have distally coalesced pubes, a fact hitherto regarded typical of the *Plateosauridae*.
8. A great difference is shown to exist between the ischium of the *Anchisaurid* *Dromicosaurus* and that of the *Plateosaurid* *Teratosaurus*. Could this difference be of family value?
9. Another great difference is pointed out between the *Anchisaurid* *Dromicosaurus* and *Plateosaurus* *Quenstedti*. Could this also be of family value?
10. What has been accepted to be the left lower arm of European *Plateosaurids* is shown to be really the right lower arm.

PLATES XI TO XXIII

PLATE XI.

Eucnemesaurus fortis.

- Fig. 1. Lateral view of left tibia. $\times \frac{1}{4}$.
„ 2. Posterior view of left tibia. $\times \frac{1}{4}$.
„ 3. Medial view of upper end of left pubis. $\times \frac{1}{2}$.
„ 4. Anterior view of upper end of left pubis. $\times \frac{1}{2}$.



PLATE XII.

Eucnemesaurus fortis.

- Fig. 1. Lateral view of upper half of left femur. The upper ends of the trochanter major and the trochanter quartus are well visible. Slightly more than $\times \frac{1}{3}$.
- „ 2. View of polished lower end of the femur of fig. 1. Natural size.
- „ 3. Right side view of centrum of dorsal vertebra. $\times \frac{1}{2}$.
- „ 4. Upper view of centrum of dorsal vertebra. $\times \frac{1}{2}$.

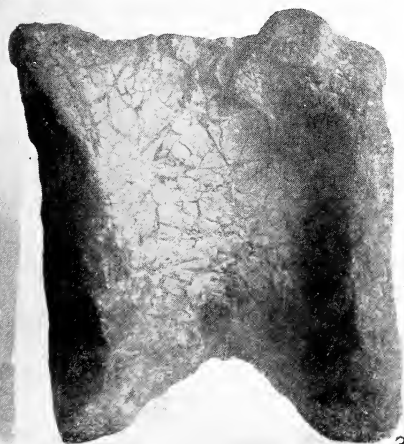


PLATE XIII.

Eucnemesaurus fortis.

Fig. 1. Left side view of caudal vertebrae. About $\frac{1}{4}$ nat. size.

Dromicosaurus gracilis.

- „ 2. Anterior view of left femur $\times \frac{1}{4}$. The foramen nutritivum is well shown above the middle of the bone.
- „ 3. Lateral view of left femur. $\times \frac{1}{4}$.
- „ 4. Posterior view of left femur. $\times \frac{1}{4}$.
- „ 5. Postero-lateral view of proximal end of left radius. Slightly more than $\times \frac{1}{3}$.
- „ 6. Proximal articulation surface of left radius. Nat. size. The anterior end is at the left-hand side
- „ 7. Lateral view of the distal end of the right metatarsale III. Slightly more than $\times \frac{1}{3}$.
- „ 8. Lateral view of the distal end of the right metatarsale I Slightly more than $\times \frac{1}{3}$.

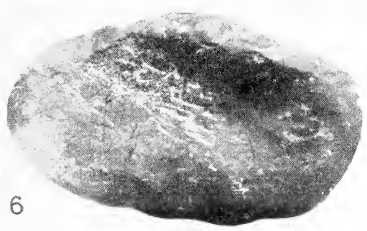
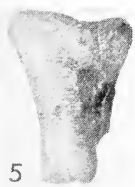
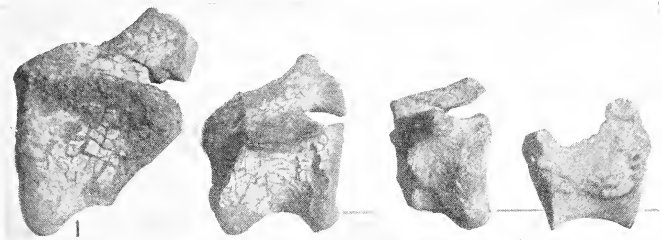


PLATE XIV.

Dromicosaurus gracilis.

- Fig. 1. Anterior view of right tibia. Slightly more than $\times \frac{1}{3}$.
,, 2. Lateral view of right tibia. Slightly more than $\times \frac{1}{3}$.
,, 3. Posterior view of right tibia. Slightly more than $\times \frac{1}{3}$. The head
is very much foreshortened in this figure, but its correct
shape and position will be clear after comparison with figs.
1 and 2.
,, 4. Anterior view of the distal end of the right metatarsale III. $\times \frac{1}{2}$.
,, 5. Lateral view of the proximal end of the left metatarsale III. $\times \frac{1}{2}$.
,, 6. Anterior view of the distal half of the humerus. Slightly more
than $\times \frac{1}{2}$.

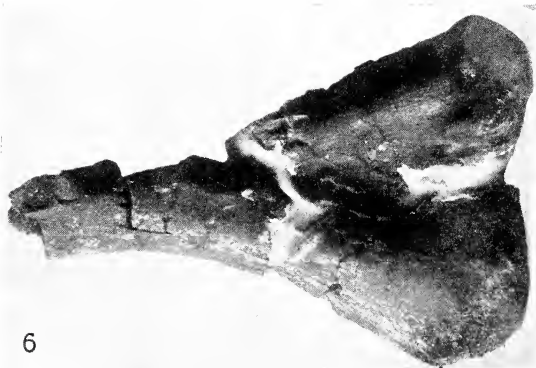
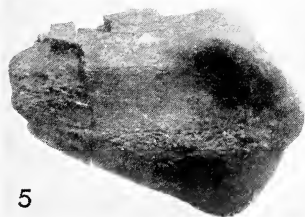
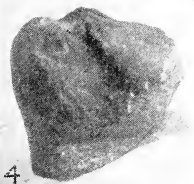


PLATE XV.

Dromicosaurus gracilis.

- Fig 1. Lateral view of right fibula. $\times \frac{1}{3}$.
,, 2. Anterior view of right fibula. Slightly more than $\times \frac{1}{3}$.
,, 3. Medial view of right fibula. $\times \frac{1}{3}$.
,, 4. Posterior view of the ischia, as preserved. $\times \frac{1}{4}$.
,, 5. Lateral view of distal end of right ischium. $\times \frac{1}{2}$.
,, 6. Medial view of proximal end of left ischium. $\times \frac{1}{2}$. The articu-
lato iliaca is above and the articulatio pubica at the lower
right-hand border.

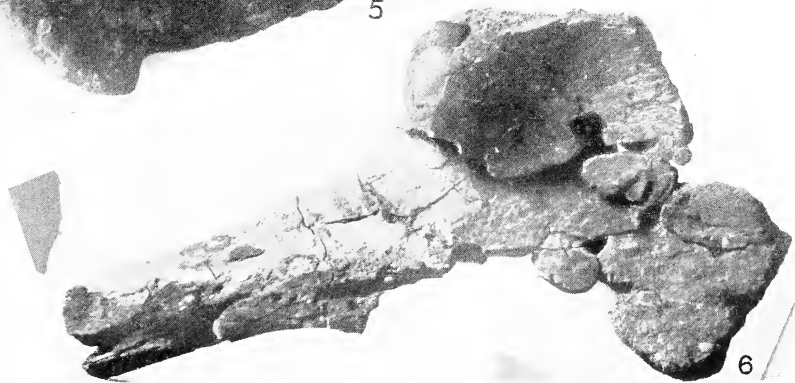


PLATE XVI.

Dromicosaurus gracilis.

- Fig. 1a. Left side view of two anterior caudal vertebrae. Slightly more than $\times \frac{1}{2}$. The distal ends are to the right.
- „ 1b. Left side view of an anterior caudal vertebra, posterior to those of fig. 1a. Slightly more than $\times \frac{1}{2}$.
- „ 1c. View of the lower surface of an anterior caudal vertebra, posterior to that of fig. 1b. Slightly more than $\times \frac{1}{2}$.
- „ 2. Medial view of the proximal end of the left pubis. $\times \frac{1}{2}$.
- „ 3. Left side view of the third neck vertebra. Slightly less than $\times \frac{1}{2}$.
- „ 4. Anterior view of the remains of the right pubis. $\times \frac{1}{4}$.
- „ 5. Anterior view of the remains of the left pubis. $\times \frac{1}{4}$. The pubes are placed with their medial sides facing each other.

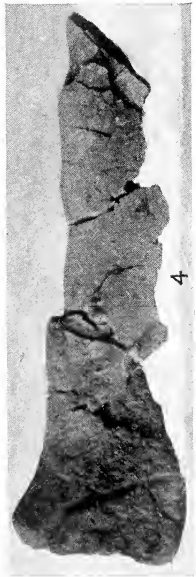
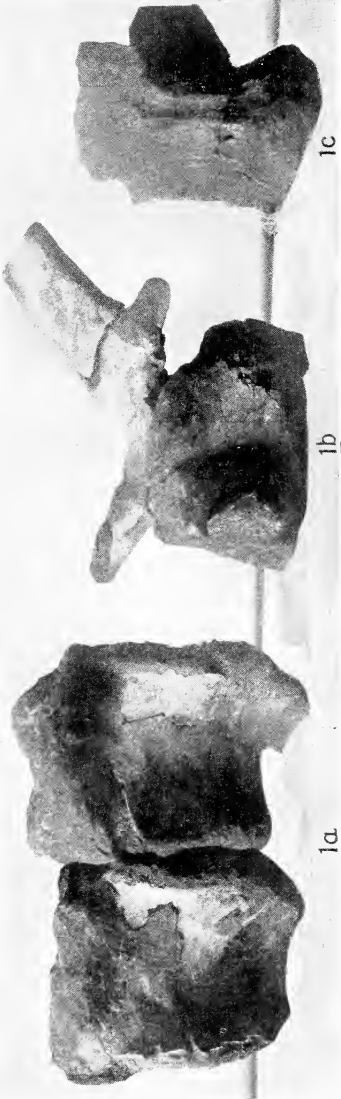


PLATE XVII.

Massospondylus Browni.

- Fig. 1. Lateral view of right scapula and coracoid. $\times \frac{1}{3}$.
,, 2. Lateral view of the left humerus. Slightly more than $\times \frac{1}{2}$. The circular depression on the posterior surface of the crista radialis is well visible.
,, 3. Anterior view of the left humerus. $\times \frac{1}{2}$.
,, 4. Lateral view of left clawphalanx I. Nat. size.
,, 5. Anterior view of first carpale of the left hand. Nat. size.
,, 6. Anterior view of second carpale. Nat. size.

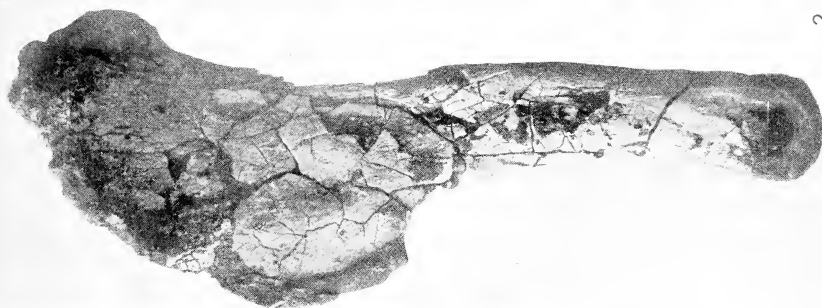
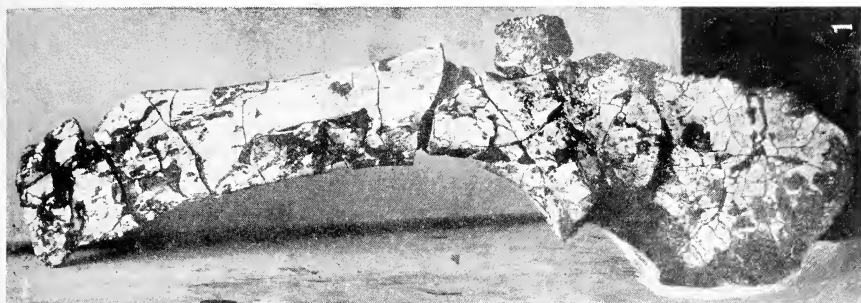


PLATE XVIII.

Massospondylus Browni.

- Fig. 1. Antero-medial view of left radius. $\times \frac{2}{3}$.
,, 2. Antero-medial view of left ulna. Slightly more than $\times \frac{2}{3}$.
,, 3. Antero-lateral view of left radius. Slightly less than $\times \frac{2}{3}$.
,, 4. Postero-medial view of left ulna. $\times \frac{2}{3}$.
,, 5. Upper view of left hand. The reconstruction is meant to show
the hand at rest. Slightly more than $\times \frac{2}{3}$.

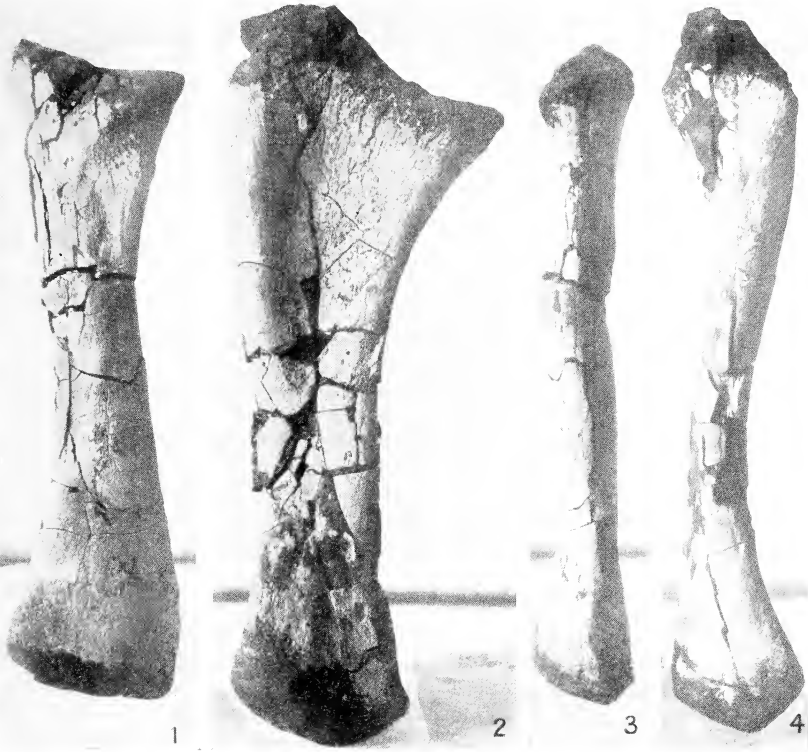


PLATE XIX.

Massospondylus Browni.

- Fig. 1. Supero-lateral view of left hand. $\times \frac{2}{3}$.
,, 2. Lateral view of left ileum. $\times \frac{1}{2}$.
,, 3. Anterior view of right pubis. $\times \frac{1}{3}$.
,, 4. Lateral view of right ischium. Slightly more than $\times \frac{1}{3}$.

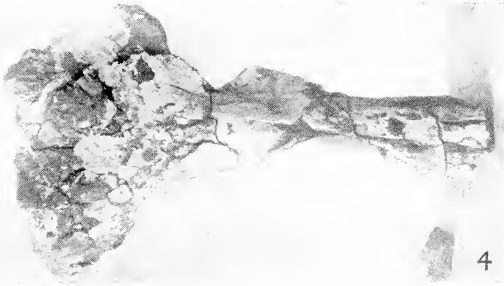
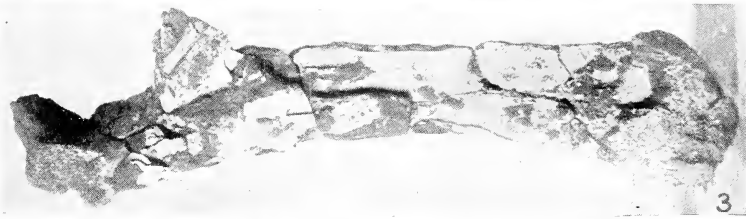
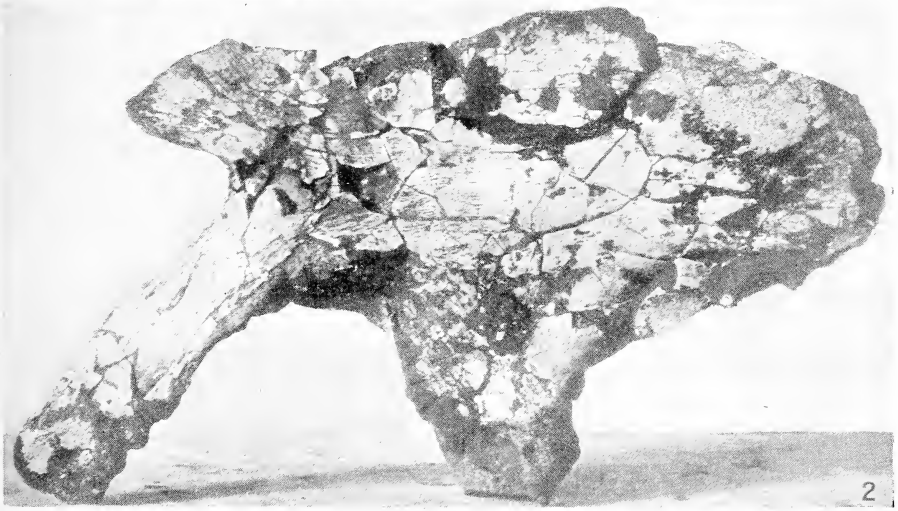


PLATE XX.

Massospondylus Browni.

- Fig. 1. Anterior view of left femur. $\times \frac{1}{3}$.
,, 2. Lateral view of left femur. Slightly more than $\times \frac{1}{3}$.
,, 3. Medial view of right fibula. $\times \frac{1}{3}$.
,, 4. Anterior view of right tibia. $\times \frac{1}{3}$.
,, 5. Left side view of the sixth to the tenth caudal vertebrae. $\times \frac{1}{4}$.

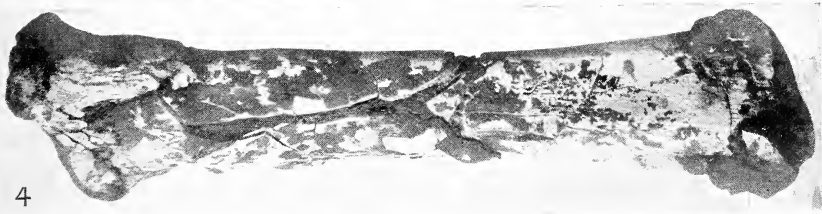
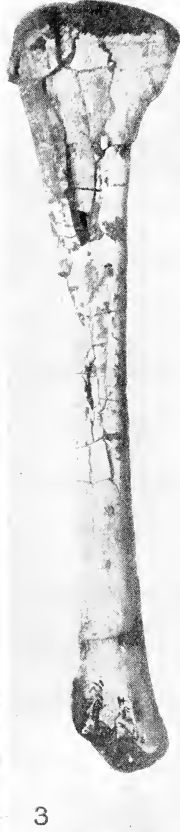


PLATE XXI.

Massospondylus Browni.

- Fig. 1. Upper view of right foot. The reconstruction is meant to show the foot at rest. Slightly more than $\times \frac{1}{3}$.
,, 2. Left side view of 10th dorsal vertebra. Slightly more than nat. size.
,, 3. Left side view of the five last neck vertebrae. $\times \frac{1}{4}$.

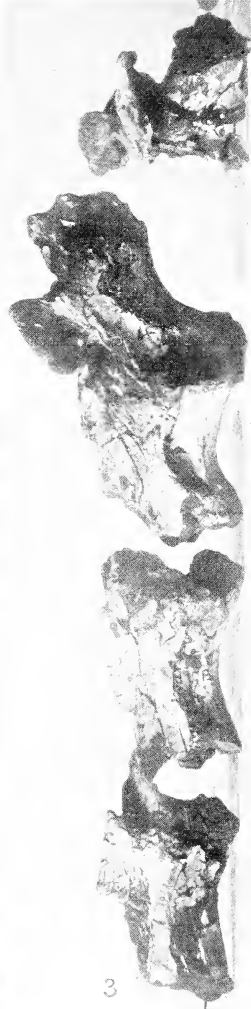


PLATE XXII.

Massospondylus Browni.

Supero-lateral view of right foot. $\times 0.53$.



PLATE XXIII.

Dinosaur Vertebra.

- Fig. 1. Left side view. Slightly more than $\times \frac{1}{2}$.
,, 2. Posterior view. Slightly more than $\times \frac{1}{2}$.
,, 3. Ventral view. $\times \frac{1}{2}$. The right side of the bone is on the right
side of the figure.



1



2



3

In conclusion I beg to thank Mr H. WALKER of St Fort and Mr W. H. MOORE of Slabberts for their generosity; and Mr S. H. HAUGHTON of Cape Town for valuable information. My thanks are also due to the Director of the South African Museum, Cape Town, for the loan of v. HUENE'S "Die Dinosaurier der europäischen Triasformation," and, last but not least, to its author, for without the assistance of his great work I would not have been able to describe our material.

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DESCRIPTION OF SOME CRETACEOUS AMMONITES FROM PONDOLAND

By Dr E. C. N. VAN HOEPEN, M.I.

With three plates.

THE ammonites here described were purchased with other fossils from Mr J. VENTER, who collected them on the coast of Pondoland, near the mouth of the Umzamba river.

Phylloceras umzambiense n.sp. Pl. XXIV, figs. 1—3.

The whorls of the discoidal shell are strongly involute and higher than broad. The greatest thickness of the whorl lies internal to the middle of the flanks. The external surface is broadly convex and the sides are slightly flattened. The umbilicus is narrow and deep, the umbilical surface moderately inclined.

The ornamentation consists of numerous, crowded, thin, wire-like ribs. These ribs commence deep down in the umbilicus and, on passing on to the flanks, swerve forwards; from near the middle of the flanks to the periphery they are practically straight and directed slightly backwards. The outer end of the ribs may be slightly stronger than the inner end, but on one portion of the shell the ribs are stronger on the internal half of the flank than on the outer. Short ribs, starting at or near the middle of the flanks and running across the periphery, are regularly intercalated between the long ones. Sometimes, though very exceptionally, these ribs start nearer to the umbilicus. They all run practically straight to the periphery, in the same direction as the long ribs. The surface of the shell is weakly corrugated near the umbilicus. The corrugations are low and short, disappearing before reaching the middle of the flanks. They also disappear on the umbilical surface. Their curvature is the same as of the ribs in this region. Their breadth is such that they bear from four to six ribs.

The lobe-line is phylloid. The anterior terminations of the saddles are broad and well rounded. This fact, however, is only seen well through the transparent shell; if this be removed with acid the lobe-line seems to suffer easily. In general the lobe-line agrees very well with that of *Phylloceras Forbesianum* D'ORB sp. The siphonal saddle, however, is not so sharply pointed as in that species. The external lobe has nearly the same length as the first lateral lobe. The external saddle and the first lateral saddle are both symmetrically divided by a secondary lobe. The second lateral saddle shows three anterior terminations. The auxiliary saddles, six in number, become rapidly smaller.

Measurements:

Diameter	...	...	...	...	44 mm. (1)
Height of last whorl	...	...	...	...	27 ,, (0.61)
Thickness of last whorl: actual	16 mm.	was probably	17	,,	(0.39)
Width of umbilicus	...	...	...	2	,, (0.05)

Superficially there is some resemblance between this form and *Phylloceras Nera* FORBES sp. The Indian species, however, has a series of radial sulci, around the umbilicus, which are apparently absent in our form. The radial corrugations of our form are apparently absent in *P. Nera*. The new species is also relatively thicker than *P. Nera*. There is a great difference between the

lobe-line of the new form and that of *P. Velledae* and allied forms. In the Indian forms the external lobe is very much shorter than the first lateral lobe, whereas in the Pondoland ammonite the two lobes are nearly of the same size. There is close agreement between the lobe-line of our form and that of *Phylloceras* sp. mentioned by Woods from Pondoland ("The Cretaceous Fauna of Pondoland," *Ann. S. Afr. Mus.* vol. iv. Pt. vii. Pl. XLI, fig. 4). There is, however, difference in the shape and the ribbing of the shell. There is also a great resemblance between the suture-line of *P. Rogersi* KITCHIN and that of our form. The shells differ, however, in shape and ornamentation.

The specimen is imperfect and wholly septate. One side of the last whorl has weathered away.

Gaudryceras amapondense n.sp. Pl. XXIV, figs. 4, 5.

Shell discoidal, compressed. Sides of whorl slightly convex and convergent towards the rounded periphery. Last whorl rather rapidly increasing. The umbilicus is large, the umbilical surface fairly steep and the umbilical margin strongly convex. Whorls higher than broad and covering about half of the flanks of the preceding whorl.

Whorls ornamented with low ribs, which are narrow within the umbilicus and become broader towards the periphery. Between these other ribs are intercalated, which are only faintly visible at the umbilicus. Ribs of unequal breadth and separated by unequal distances. Both ribs and interspaces are covered by numerous fine ribs. The last whorl shows four ribs, at a distance of about 90 degrees from each other, which are much broader and thicker than those in their immediate vicinity. One of these ribs had to be removed in studying the suture-line and was seen to correspond with a constriction on the internal cast. The last of these ribs is immediately preceded by three others, which are also broad and thick and separated by broad interspaces. The umbilical portion of all the ribs is concave forwards, on the sides they are convex forwards and near the ventral border they are again concave forwards. Their ventral portion was not seen. Inner whorls covered with finer ribs; here and there is a coarser one followed by a deep groove.

The suture-line has not been seen completely. That which is visible consists of a portion of the first lateral lobe, both lateral saddles, one auxiliary saddle and a portion of another. The remaining space between the visible portion of the last saddle and the umbilical suture is slightly broader than the breadth of this portion. The auxiliary lobes and saddles become smaller towards the umbilical suture and run slightly backwards. Further detail may be gathered from the figures.

Measurements:

Diameter	...	...	...	...	109 mm. (1)
Height of last whorl	...	...	...	...	47 ,, (0.43)
Thickness of last whorl	...	...	...	perhaps 41	,, (0.38)
Height of penultimate whorl	...	...	...	about 20	,, (0.18)
Thickness of penultimate whorl	...	...	...	9	,, (0.08)
Diameter of umbilicus	...	...	...	28	,, (0.26)

As the thickness over the longest diameter cannot be accurately given, the three first measurements are again taken at about 90 degrees back from the anterior end.

Diameter	...	...	...	...	88 mm. (1)
Height of last whorl	...	...	...	...	38 ,, (0.43)
Thickness of last whorl	...	...	...	...	29 ,, (0.33)

The specimen is entirely septate. No species is known to me with which the new form could be confounded. Remarkable in the species, although by no means singular, is that the breadth of the last whorl is relatively greater than that of the preceding one, and further the extraordinary height of the penultimate whorl with regard to its breadth.

Tetragonites teres n.sp. Pl. XXV, figs. 1, 2.

Shell discoidal, umbilicated, with a few rapidly increasing whorls. Whorls higher than broad. Greatest thickness at the umbilical margin. Sides of whorl flat, becoming rounded towards the periphery. External surface strongly convex, rounding off gradually into the sides. Umbilical surface very steep. Inclusion two-thirds. The surface of the shell is smooth and covered with growth-lines, which are only visible with a magnifying glass. Two faint constrictions are visible, having the same shape as those of *Tetragonites epigonum*. Lobe-line very imperfectly known; as far as visible showing the general type of *Tetragonites*.

Measurements:

Diameter	...	...	69 mm. (1)	At diam. of 57 mm. (1)
Height of last whorl	...	...	39 ,, (0.57)	31 ,, (0.54)
Thickness of last whorl		?		26 ,, (0.46)
Diameter of umbilicus			14 ,, (0.20)	

There is only one specimen upon which the above description has been based. About a quarter of its last whorl is probably body-chamber. The specimen has suffered somewhat from lateral compression. A portion of the last whorl, however, has not been compressed at all, and in this region the measurements on the diameter of 57 mm. have been taken.

The new species differs from *Tetragonites Timotheanum* MAYOR sp. and from *T. epigonum* KOSSMAT by the fact that its whorls are higher than broad; in the two species mentioned they are broader than high. *T. Timotheanum* is also more involute and its whorls have an angular section. The section of the whorls of *T. epigonum* is also more trapezoidal than that of *T. teres*. The height of the last whorl is greater than half the diameter of the shell in the new species, whereas in *T. Timotheanum* it is equal to or, especially in *T. epigonum* and young specimens of *T. Timotheanum*, less than half this diameter.

Holcodiscus Faku n.sp. Pl. XXV, figs. 3, 4. Pl. XXVI, figs. 1, 2.

There are two specimens which are regarded as belonging here. The following description has been taken from the smaller of the two.

Shell discoidal. Whorls higher than broad. Greatest thickness at the umbilical edge. Sides of whorl nearly flat near the umbilical margin, becoming more and more convex towards the periphery. External surface strongly convex. Umbilical surface low and very steep. Involution moderate, between one-half and two-thirds of the preceding whorl being embraced.

Umbilical surface smooth. Sides of whorl covered with numerous, high and narrow ribs. All ribs pass with undiminished strength over the outer surface. The ribs emanate partly from strong, sharp, radially elongated tubercles, which have a flat and steep anterior surface and which stand on the extreme umbilical margin. The umbilical edge of these tubercles passes for a short distance on to the umbilical surface and stands practically perpendicular on the lateral edge of the protuberances. The ribs emanate from these tubercles in an irregular way. Sometimes the edge of one rib is continuous with the edge of the tubercle, while another rib emanates from its side. In other instances the edges of two ribs are continuous with the edge of the

tubercle. Sometimes the edge of the tubercle is continuous with one rib, while another rib begins at each of its sides. Again, one rib is continuous with the edge of the tubercle, while another emanates from one side and two from the other. Sometimes the edge of the tubercle ends in a groove between two ribs. Now and then one of the ribs starts independently of any tubercle at the extreme edge of the umbilicus. Now and then, by no means at regular intervals, a short rib is intercalated between two others; these short ribs start at about the middle of the flank and behave further as the others. At irregular intervals the whorl is traversed obliquely by a deep groove, which is bordered behind by a thick ridge and in front by a narrow ridge. Its course is sinuous, being slightly convex forwards near its inner end, concave forwards near its middle and convex forwards at its outer end and on the external surface. The ridge in front of the groove starts on the umbilical surface, just inside the umbilical edge and passes on to the flank without forming a tubercle. It is not in touch with any other rib. The rib behind the groove starts at an umbilical tubercle and either bifurcates therefrom with another rib, or is the only rib continuous with the lateral edge of the tubercle, or emanates from the anterior surface of a tubercle, from which another rib starts in continuous line with its lateral edge and still another from its posterior side. This rib behind the groove cuts off two or three other ribs. As it crosses the external surface it becomes thicker and in the last two sulci of the larger specimen very much so. There are six of these grooves on the last whorl. The course of the other ribs is somewhat irregular. Many of them are very slightly convex forwards near the middle of the flank. A few are straight in this region. They mostly cross the external surface with scarcely any convexity forwards. In some of those near the sulci, however, the forward inflexion on the external surface is greater. The spaces between the ribs are much broader than the ribs and also broader than the nearest sulcus. On the end of the last whorl, which possibly partly represents the posterior end of the body-chamber, the interspaces become much broader and the ribs thicker. In the second specimen, of which apparently a large part of the body-chamber has been preserved, the ribs are very thick on this portion and the interspaces very broad.

The lobe-line resembles most that of *Holcodiscus*. The external saddle and both lateral saddles are symmetrically divided by a secondary lobe. The external saddle is slender and longer than the others. The first lateral lobe is trifid and longer than the ventral lobe. The second lateral saddle does not touch the umbilical margin. On the umbilical surface the lobe-line runs backwards and forms three very small saddles.

Measurements:

	Small spec.	Large spec.
Diameter	64 mm. (1)	62 mm. (1)
Height of last whorl ...	27 ,, (0·42)	26 ,, (0·42)
Thickness of last whorl	21 ,, (0·33)	22 ,, (0·35)
Height of penult. whorl	16 ,,	19 ,, (0·30)
Thickness of penult. whorl	13 ,,	16 ,, (0·26)
Diameter of umbilicus	18 ,, (0·28)	18 ,, (0·29)

The end of the last whorl of the type (small specimen) is damaged on one side and its thickness cannot therefore be accurately given. 21 mm. is its approximate dimension. The sides of the last whorl of the large specimen are also damaged and its thickness is therefore also given approximately. The measurements of the penultimate whorl of the type are not comparable with those of the last whorl, because they had to be taken on another diameter.

The actual diameter of the second specimen is 82 mm. As the other measurements could not be taken on this diameter it was thought better to take them over that of 62 mm., whereby they would all be on one line.

The new form shows great resemblance with species of the group *Holcodiscus Aemilianus* STOL. It differs from *H. Kandi* STOL. sp. by being more involute, by the different arrangement of the ribs and their comparative straightness. *H. madrasinus* STOL. sp. has a last whorl, which is twice as high as broad. It is also more involute and its constrictions are more numerous. In *H. karapadensis* KOSSMAT the ribs are flattened on the flanks and on the periphery, while the sulci are directed much more forwards. *H. buddhaicus* KOSSMAT shows great resemblance in the ornamentation, but differs in the fact that its whorls are broader than high.

Named after FAKU, a former paramount chief of the Pondo tribe.

Holcodiscus africanus n.sp. Pl. XXVI, figs. 3—5.

Shell discoidal. Last whorl higher than broad. Greatest thickness of whorls at the umbilical edge. Sides of whorl nearly flat near the umbilical margin, becoming more and more convex towards the periphery. External surface strongly convex. Umbilical surface low and very steep. Involution moderate, about one-half of the preceding whorl being embraced.

Umbilical surface smooth. Sides of whorl covered with numerous narrow, rounded ribs, which are strong on the sides but very faint at the periphery. Most of the ribs emanate from tubercles on the extreme umbilical margin. The tubercles have mostly a more or less radially directed edge; the ribs emanate from them by twos, while a rib originates at the side of the tubercle in front and behind of this pair. Practically, therefore, there are four ribs to one tubercle. Near an old mouth groove this arrangement may become slightly irregular, through the presence of an extra rib. All the ribs have the same relative length. At irregular intervals the whole whorl is traversed by a deep groove, which is bordered in front by a thick ridge. Near the periphery the hinder border of the groove is formed by an equally strong rib, but on the flanks this rib is very much weaker. The course of the groove is sinuous; at the umbilical edge it is concave forwards, near the middle of the flank it is convex forwards and past this middle it is again concave forwards. Its external end makes a strong anterior sweep towards the periphery. On the periphery it is strongly convex forwards. The anterior rib does not form a tubercle, although it is prominent on the umbilical edge. It is not in touch with any other rib. That portion of the posterior rib, which is actually rib, starts at or near the middle of the flank; the first rib behind this begins at the posterior edge of the groove, about midway between the middle of the flank and the umbilical edge. The second rib behind it starts on the anterior surface of a tubercle, which stands on the edge of the groove. There are four of these constrictions on the last whorl. The course of the other ribs is very regular. They have all got a stretched S-shape, their inner half being very slightly convex and their outer half concave forwards. As far as they are visible on the periphery they are convex forwards. The spaces between the ribs are broader than the ribs and on the middle of the flank only slightly broader than the nearest sulcus in this region.

The lobe-line resembles most that of *Holcodiscus karapadensis* and *H. buddhaicus*. The external saddle and both lateral saddles are symmetrically divided by a secondary lobe. The external saddle is slender and longer than the others. The first lateral lobe is trifold and longer than the ventral lobe. The second lateral saddle does not touch the umbilical margin. The first auxiliary

lobe lies external to the umbilical margin. It is very short and its posterior end lies far in advance of the posterior end of the second lateral lobe. On the umbilical surface the lobe-line runs as far backwards as the posterior end of the second lateral lobe.

Measurements:

Diameter	...	...	...	44 mm. (1)
Height of last whorl	...	approximately about	17	,, (0.39)
Thickness of last whorl	...	...	about 12	,, (0.27)
Height of penultimate whorl	...	...	8	,, (0.18)
Thickness of penultimate whorl	...	...	8.5	mm. (0.19)
Diameter of umbilicus	...	...	13.5	,, (0.31)

This is another form belonging to the group of *Holcodiscus Aemilianus* STOL. sp. It differs from *H. Kandi* STOL. sp. by having the ribs flattened on the periphery and by the fact that all the ribs start at the umbilicus. The constrictions have also a different shape. In *H. madrasinus* STOL. sp. the ribs pass with undiminished strength across the periphery, while the constrictions are more numerous and cut off more ribs. There is great resemblance between our form and *H. karapadensis* KOSSMAT. In the Indian ammonite, however, the ribs are not conspicuous on the inner portion of the flank and the sulci are directed more forwards, so that more ribs are cut off. The shape of the sulci is also different. The height of the whorl augments quicker in our form than in *H. karapadensis*. In *H. buddhaicus* the whorls are broader than high.

One side of the last whorl shows a portion of the last mouth edge. If this edge is identified correctly, the body-chamber occupied slightly more than half a whorl.

PLATES XXIV TO XXVI

PLATE XXIV.

Phylloceras umzambiense.

- Fig. 1. Lateral view. $\times 1.87$.
,, 2. Half outline of transverse section at greatest diameter. Natural size.
,, 3. Suture. Natural size.

Gaudryceras amapondense.

- ,, 4. Lateral view. Natural size.
,, 5. Half outline of transverse section at diameter of 99 mm. Natural size.



1

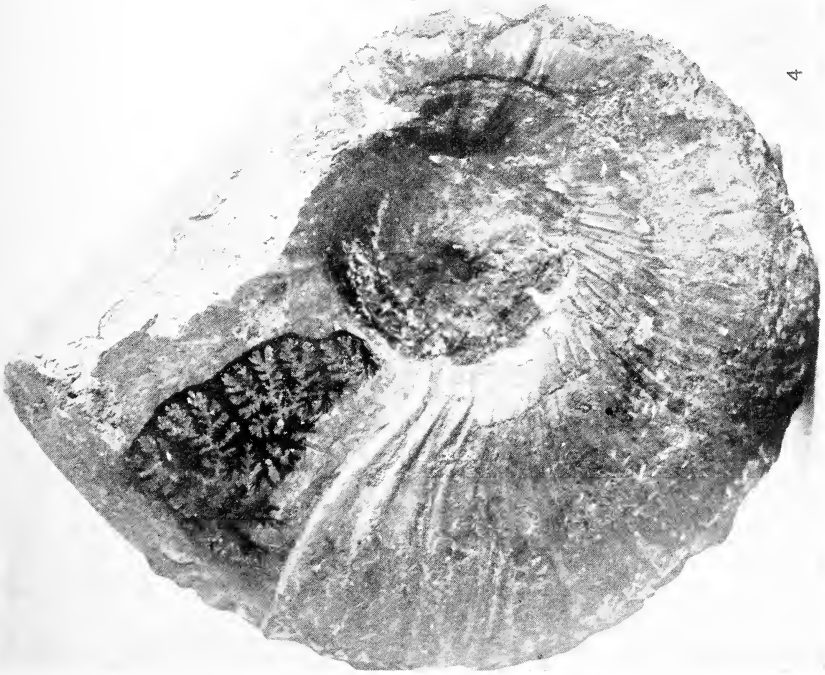


2

Brachioleptæna
3



5



4

PLATE XXV.

Tetragonites teres.

- Fig. 1. Lateral view. Slightly less than natural size.
,, 2. Outline of transverse section through last whorl, where it has
not suffered from pressure, at a diameter of 57 mm.

Holcodiscus Faku.

- ,, 3. Lateral view of type. Natural size.
,, 4. Outline of transverse section at a diameter of 56 mm. Natural
size.

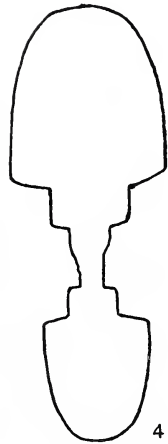
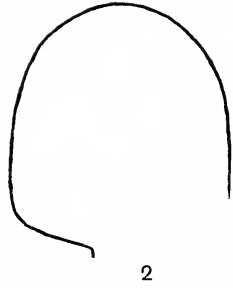


PLATE XXVI.

Holcodiscus Faku.

- Fig. 1. Lateral view of large specimen. Natural size.
,, 2. Suture of large specimen. Natural size.

Holcodiscus africanus.

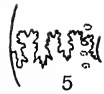
- ,, 3. Lateral view. Natural size.
,, 4. Half outline of transverse section at diameter of 40 mm.
Natural size.
,, 5. Suture. Natural size.



2



4



5

ANNALS MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VII

PART 3 *containing*

On the South African *Notodontidae*, with Descriptions of Apparently New Genera and Species.
By A. J. T. JANSE. (With 14 plates.)



Issued June 30th, 1920

PRINTED AT THE UNIVERSITY PRESS
CAMBRIDGE, ENGLAND

1920



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ON THE SOUTH AFRICAN *NOTODONTIDAE*

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By A. J. T. JANSE.

With 14 plates.



As far as the sub-continent is concerned, the family *Notodontidae* has, on the whole, neither been extensively dealt with nor properly classified. Further, no attempt has yet been made to catalogue this group of South African moths, although the country is fairly rich in species. It has been my good fortune to secure and study the majority of these, and only three genera recorded from S. Africa have not been before me.

The most comprehensive account of the family is to be found in Professor Packard's *Monograph of the Bombycine Moths of America north of Mexico*. This work deals only with North American genera of which few indeed occur in S. Africa. It has nevertheless been of great assistance to me although I have not been able to apply the principles of sub-family grouping therein annunciated owing to slight acquaintance with local larvae. In the future, therefore, when these have become better known, especially the larvae of the first instar, some rearrangement of the genera may become necessary.

In the task which I have set myself, I have also found the *Moths of India*, vol. 1. by Sir George Hampson most useful although not more than ten Indian genera occur in South Africa. Further, a paper on the American *Notodontidae* by Schaus which appeared in the *Trans. Ent. Soc. Lond.* 1901 (pp. 257-343), and several papers on European members of this family have also served a useful purpose.

However, the generosity of Sir George Hampson in supplying me with notes on genera, which have no doubt led to the avoidance of many an error, has been my main assistance and I take this early opportunity of expressing my deep sense of gratitude to him.

As usual, the conventional but entirely artificial northern boundary of South Africa has been adopted; *i.e.* the southern banks of the Zambesi and Quinene rivers.

The material examined is typical of the whole area south of this line of demarcation. Most of the specimens came from Natal, the Transvaal or Southern

Rhodesia, the last yielding several new and peculiar forms. I have had access to nearly all the available specimens in our local Museums and private collections; among the latter I would mention those of Messrs E. E. Platt, E. L. Clark and Father J. A. O'Neil.

So far as my knowledge of the moths goes, the distribution of the *Notodontidae* in S. Africa is interesting inasmuch as scarcely any species peculiar to the Cape Province have come under my notice. This does not obtain with the *Lymantriadae*, of which certain genera were rather well represented in that region. Although it is by no means so rich in Heterocera as the Eastern region, I cannot help thinking, that a more systematic survey would show more *Notodontidae* in the Cape Province than we know of at present.

It is not unlikely that some of the insects herein described as new species have been previously described from Central Africa, because the references at my disposal do not include all the literature of the *Notodontidae* of Africa; however, every possible precaution has been taken to guard against duplication.

The references given are those which I have used, but all synonyms have not necessarily been given for each case.

The measurement of the span has been arrived at by doubling that taken from the middle of the thorax to the tip of the fore wing.

Unless stated to the contrary, the point at which an inner vein branches away from an outer is a proportion of the length of the outer, as measured from the cell to the margin

In many instances the interrelationship of the various genera has not been very clear to me. There are gaps which may yet be filled by new forms or which were once occupied by some now extinct. Packard has defined with more or less success seven sub-families. For my own part I recognise eight groups, but it is questionable whether these have the value of sub-families.

GROUP I.

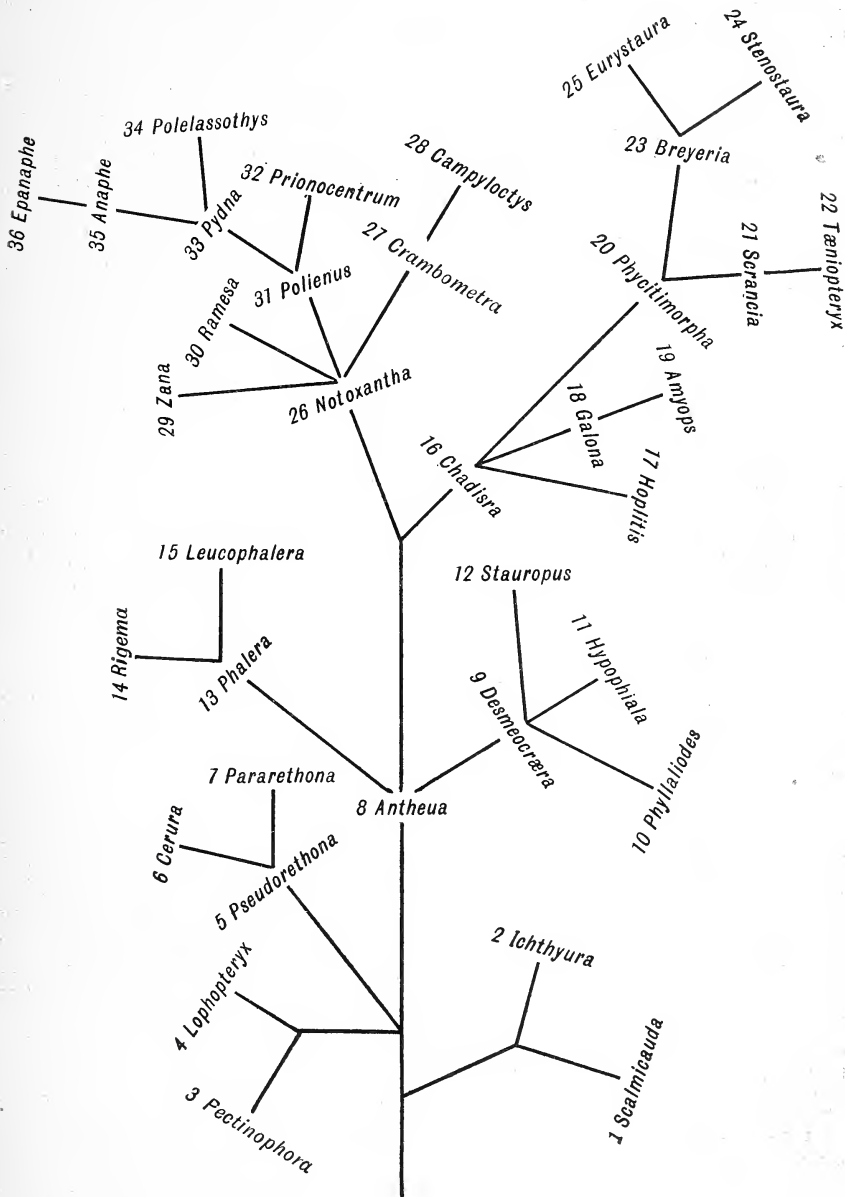
This group comprises the genera *Scalminicauda* and *Ichthyura*, of which the members are characterised by their hairy eyes, and their tendency to develop tufts on the thorax, peculiarities of no other Notodontids. *Ichthyura* is the more specialised genus, but I hardly think that it originated from *Scalminicauda*.

GROUP II.

The two genera *Pectinophora* and *Lophopteryx* compose this group of moths peculiar for the tufted inner margin of the fore wing. I take this group to have originated from an ancestral form common to it and to *Antheua* as its structure is rather more primitive than that of *Antheua* although similar.

GROUP III.

This group I also regard as having originated from the root common to groups II and V, although no trace can be found elsewhere of the spur on the fork of vein *1 b* of fore wing, peculiar to this group and possibly a rather primitive character. This *Cerura* group has three genera: *Pseudorethona*, *Cerura* and *Pararethona*; the spur on *1 b*, the scaling of the legs and the branches of the antennae all indicate close affinity. *Cerura* has lost the median spur on the hind legs, and for this reason is considered specialised; but, on the other hand, it has a bar between the upper median and vein 8 of the hind wing; this bar is missing in *Pseudorethona*. *Pararethona* may ultimately prove to be connected in one way or another with *Chadisra* but it certainly also exhibits relationship to the two other genera of the group.



Phylogeny of the Notodontidae.

GROUP IV¹.

This may be called the *Desmeocraera* group, comprising the genera *Desmeocraera*, *Phyllaliodes*, *Hypophiala* and *Stauropus*, the members being peculiar as the proboscis is absent or, when present, very weakly developed.

Of these genera *Desmeocraera* is the largest South African genus and peculiar for (1) the absence of the areole, (2) for its well developed palpi, (3) for possessing spurs on the hind legs, (4) for the presence of all veins, (5) for the smallness of the third joint of the palpus. *Stauropus* originates directly from *Desmeocraera*, having all the veins but only two spurs on the hind legs; in both genera the terminal part of the spurs is peculiar and the palpi are reduced in size and porrect.

The remaining two genera *Hypophiala* and *Phyllaliodes* may have originated near *Desmeocraera*, but the position of *Phyllaliodes* in particular, is far from clear to me as veins 6 and 7, 8, 9 and 10 suggest that they arrived from a form having an areole in the fore wing. The palpi in both genera are however very much reduced. There exists in these two genera a remarkable likeness to the *Striphnopterygidae* in general appearance.

GROUP V.

This group should most probably include *Antheua*, from which *Phalera* branches off more or less directly as it shows a close affinity to that genus, being differentiated from it by (1) the more elongated fore wing; (2) the position of veins 6 and 7; (3) the presence of the bar in the hind wing; (4) the shorter and less upturned palpi; (5) the reduced pectination of the antennae; (6) the general pattern of the fore wing, the last differentiating it at once. Both *Rigema* and *Leucophalera* may have originated from *Phalera*. In *Rigema* the teeth of the spurs have been more developed, the palpi are more porrect and shorter, but the markings on the abdomen are as in *Antheua* and *Phalera*. *Leucophalera* shows a similar development of the spurs, but the rows of teeth are shorter, the bar in the hind wing is absent, in the fore wing veins 6 and 7 originate in a different way and the process of the fore tibia is also different from that of any of the previous genera.

GROUP VI.

This may be named the *Chadisra* group. It comprises *Chadisra*, *Hoplitis*, *Galona* and *Amyops*. The genus *Chadisra* shows affinity to *Antheua* in the structure of the palpi and in the venation of the wings; but the hind wing has a bar, and the fore wing is more narrow and elongate with a corresponding decrease in surface of the hind wing; these two last characters are found more or less in all genera of this group. There is also a tendency for the branches of the antennae to be reduced; these in the more generalised genera are rather well developed. The process of the fore tibia is of the same type as that of *Antheua* and the spurs, though longer, terminate in the same manner. I think two branches sprung from this genus; one being *Hoplitis*, which preserves the upturned palpi but has lost the areole through anastomosis, the other, com-

¹ Groups IV, V and VI are in many ways closely allied and I regard them as originating from a form very similar to the present members of *Antheua*. Possibly they should be included with that genus so as to form one large group. *Antheua* is certainly the most generalised of all the remaining genera although containing less species than one would expect for such an old genus. Even nowadays *Antheua* displays a great tendency to vary structurally. It is peculiar, that the bar between the upper median and vein 8 of the hind wing is absent in *Antheua*, present in groups VI and VIII and absent again in group IV.

prising *Galona* and *Amyops* which preserve the areole whilst the palpi become much reduced; in *Amyops* the median spurs of the hind legs also disappear.

GROUP VII.

This may be called the *Scrancia* group, comprising six genera. It may have originated somewhere near *Chadisra*, the similarity in structure and the tendency of the fore wing to be narrow, pointing to this. But here the hind wing is ample and remains usually so, while the rather long legs, especially of *Scrancia*, are extraordinary features in the Notodontidae. I think that *Phycitimorpha* is the oldest genus and from it two branches have developed: the "*Scrancia*" branch, in which the proboscis remained, and the "*Breyeria*" branch with this organ lost to its three genera. From *Scrancia*, *Taeniopteryx* may have developed, judging by (1) the coalescence of the areole of the fore wing, (2) the stalking of vein 6 to the stalk of 7-10, (3) the obsolescent vein 5 in the hind wing; a puzzling feature is, however, the rather long process of the fore tibia which in *Scrancia* is short and broad. It is remarkable that in *Breyeria* this process is also longer than in *Scrancia*, even longer than in *Phycitimorpha*; further the members of *Breyeria* lack a proboscis, have reduced palpi and much broader fore wing than those of the *Scrancia* branch. The members of the genus *Stenostaura* are remarkable for (1) the stalking of veins 3 and 4 in both wings, (2) the absence of the median spurs on the hind legs, (3) the shorter process on the fore tibia, and (4) their palpi. In *Eurystaura* on the other hand the areole is lost by coalescence, vein 5 of the hind wing becomes very faint and the process of the fore tibia is much shorter than in *Breyeria*.

GROUP VIII.

This I call the *Notoxantha* group. It comprises as many as eleven genera, several of which have a more or less developed bar in the hind wing. The group originated somewhere near *Antheua*, *Zana* in particular closely resembling *Antheua*. *Notoxantha* shows several generalised characters but is probably not quite like the form from which the others must have come. *Crambometra* is peculiar for the well-developed branches of the antennae; the venation of the fore wing resembles *Notoxantha*, but in that of the hind wing vein 5 is reduced; the genus *Campyloctys* is closely allied to *Crambometra* as is clearly indicated by the antennae, but the venation of the fore wing is remarkable, as veins 8 and 9 have become separated, thus doing away with the areole and causing 7 and 8, 9 and 10 to be stalked; here also the palpi are more porrect. *Zana* may have originated directly from *Notoxantha*, the spurs are shorter, the bar of the hind wing is less distinct and the palpi are more reduced and porrect. *Ramesa* stands more or less alone by the peculiar development of the antennae, but the fore wing agrees in venation, but not in markings, with *Notoxantha*.

Polienus and *Prionocentrum* come somewhere before *Pydna*, but the relation of both these genera is not quite clear to me; on the whole *Prionocentrum* is a rather peculiar Notodontid.

The peculiar reduction in the *Pydna* branch is the disappearance of the areole through anastomosis of the greater part of vein 10 with veins 6, 7, 8, 9 (in *P. rubrifascia*, indeed, it can be seen how the areole disappeared); all other characters are remarkably like those of *Notoxantha* except that the frons is smooth. *Polelassothys* has (1) the palpi very much reduced, (2) only two spurs on the hind tibia, (3) vein 8 of hind wing coalescent with nearly the whole of the upper median; this last feature is particularly interesting.

The genus *Anaphe* may have originated from *Pydna*, although the reduction of the spurs as between these two genera points to one or more intermediate

genera. *Epanaphe* I consider to be directly derived from *Anaphe*, although the disappearance of vein 5 in both wings is a very sudden transition.

ACKNOWLEDGEMENTS.

THE TRANSVAAL MUSEUM: for the most generous way in which the Director allowed me to publish this paper and Mrs C. J. Swierstra for assisting me with his material.

THE SOUTH AFRICAN MUSEUM: for the loan and presents of several Notodontids and for kindly copying some descriptions not in my library.

THE NATAL AND DURBAN MUSEUMS: for the loan of their whole material of this family.

THE SOUTHERN RHODESIA MUSEUM: for the loan of specimens.

Family NOTODONTIDAE.

General build noctuiform, seldom slender; fore wing *1b* often forming a fork at base, *1c* absent, vein 5 from middle or a little above middle of discocellulars; hind wing with two internal veins, vein 5 from middle of discocellulars or absent, 8 free from base, then parallel with, or approximated to, upper median or connected with that vein by a bar, then obliquely to near apex.

KEY TO THE GENERA.

1 a.	Eyes hairy	2
b.	Eyes glabrous	3
2 a.	Fore wing with an areole	Scalmicauda p. 158
b.	Fore wing without an areole	Ichthyura p. 161
3 a.	Fore wing with one or more tufts of hairs and scales on inner margin at middle	30
b.	Fore wing without such a tuft	4
4 a.	Hind legs with four spurs	10
b.	Hind legs with two spurs only	5
5 a.	Fore wing with an areole	6
b.	Fore wing without an areole	7
6 a.	Areole long, about half the distance from upper angle to apex; abdomen with lateral tufts of hair	Amyops p. 206
b.	Areole short, less than one-third the distance from upper angle to apex; no lateral tufts of hair on abdomen	Cerura p. 170
7 a.	Fore wing with all veins present	8
b.	Fore wing with at least one vein absent	9
8 a.	Antennae bipectinated for two-thirds their length; branches in ♂ over six times shaft; fore and hind wing with veins 3 and 4 separate; hind wing with vein 5 rather weak	Stauropus p. 194
b.	Antennae bipectinated for two-thirds of shaft, but pectination short, only two times shaft; hind wing with vein 5 weak; fore wing with veins 3 and 4 on a short stalk; hind wing with veins 3 and 4 on a stalk of over one-third of 3 or from a point	Stenostaura p. 215
c.	Antennae bipectinated till the tip	Anaphe p. 232
9 a.	Fore wing with vein 8 absent; hind wing with all veins present	Polelassothys p. 229
b.	Fore wing with veins 5 and 9 absent; hind wing with vein 5 absent	Epanaphe p. 234
10 a.	Hind wing with vein 5 absent or very weak ¹	31
b.	Hind wing with vein 5 present, at least distinct	11
11 a.	Fore wing without an areole ²	12
b.	Fore wing with an areole ³	15

¹ In *Antheua dimorpha* vein 5 is very weak and the proboscis is in some specimens practically absent, but the other characters place this species provisionally in *Antheua*.

² In some cases the areole is not completed by the connection between vein 10 and the stalk of 8-9. General characters will have to decide to which group it belongs. In *Antheua* some species are very inconsistent in this character, some specimens of the same species having and lacking the areole. Many specimens have in such a case to be examined.

³ In *Chadysra* and *Antheua* the areole may be absent in some species.

- of areole (as in *A. simplex*, where 7 comes from the stalk just beyond 10) 21
- b. Fore wing with vein 7 from well beyond vein 10 27
- 21 a. Fore wing with vein 10 from the areole 22
- b. Vein 10 stalked with 8, 9 23
- 22 a. Fore wing rather produced, outer margin somewhat incurved between apex and vein 4, termen rather strongly sinuated; branches of antennae in ♂ till a little over middle of shaft and a little longer than thickness of shaft **Rigema** p. 197
- b. Fore wing not produced at apex, outer margin straight; antennae in ♂ bipectinated till at least $\frac{3}{4}$ rd of shaft and pectination about two times shaft; outer margin but slightly sinuate or not at all **Antheua** p. 175
- 23 a. Fore wing with vein 10 very shortly stalked with 8, 9; areole extremely narrow **Pydna (rubrifascia)** p. 229
- b. Fore wing with vein 10 on a stalk of about $\frac{1}{3}$ rd the distance of end of areole to apex; areole rather broad 24
- 24 a. Apex of fore wing produced; fore wing very broad, termen well curved inwards below apex **Prionocentrum** p. 226
- b. Apex of fore wing not produced, termen not curved inwards below apex 25
- 25 a. Palpi obliquely upturned; hind wing with stalk of 6, 7 at least $\frac{1}{3}$ rd of 7 26
- b. Palpi porrect; hind wing with stalk of 6, 7 very short, only about $\frac{1}{4}$ th of 7 **Leucophalera** p. 199
- 26 a. Frons with a horse-shoe-shaped prominence; antennae bipectinated till near the tip; termen rather erect, not sinuate; spurs rather thin and long **Notoxantha** p. 217
- b. Frons smooth; pectination of antennae till a little beyond middle of shaft, or only fasciculated; termen oblique and somewhat sinuate; spurs rather short and thick **Phalera** p. 195
- 27 a. Fore wing rather long and narrow; 7 stalked with stalk of 8, 9 28
- b. Fore wing broader and outer margin more erect (as in *Antheua*); 7 and stalk of 8, 9 from or from very near end of areole 29
- 28 a. Fore wing rather long, termen very oblique; a bar between upper median and vein 8 of hind wing; hind wing with dark anal macula **Chadisra** p. 200
- b. Fore wing broad; termen erect; no bar in hind wing; hind wing concolorous at anal angle **Breyeria** p. 213
- 29 a. Branches of antennae very long, about 8 times shaft, shaft curved and the ends of the branches forming nearly a straight line, extending till the tip; mid-spurs of hind legs short (not reaching beyond end of tibia); tibia densely covered with very long hair; areole of fore wing very long, reaching about half the distance from upper angle to apex **Galona** p. 205
- b. Pectination of antennae only till $\frac{4}{5}$ th of shaft, then the shaft becomes dentate; pectination about 3-4 times shaft, straight, not curved; hind legs with mid-spurs longer and more slender (reaching well beyond end of tibia); hairs on legs less dense; areole moderate, reaching till about $\frac{1}{3}$ rd of distance from upper angle to apex **Zana** p. 221
- c. Antennae unipectinate till half length of shaft, then dentate; pectination short (not over two times shaft); spurs of hind legs long, reaching far beyond end of tibia, smaller spur about half of long spur; areole long, length over half the distance of from upper angle to apex **Ramesa** p. 222
- 30 a. Areole short, about $\frac{1}{3}$ rd of vein 10; outer margin of fore wing almost

- straight; 6 remote from areole; palpi upturned, long, with 2nd joint nearly half the length of the palpus **Pectinophora** p. 164
- b. Areole long, about half length of vein 10; outer margin sinuate; 6 from areole; palpi short **Lophopteryx** p. 166
- 31 a.** Fore wing with an areole; hind wing with vein 5 present but very weak **32**
- b. Fore wing without an areole; hind wing with vein 5 absent **33**
- 32 a.** Fore wing with the areole long, 6 times breadth, formed by 8 and 9 becoming shortly stalked beyond the areole; 6 remote from the areole; antennae bipectinate, branches very long, over 8 times shaft, curved downwards; palpi upturned, rather long; hind wing with 6 and 7 remote **Crambometra** p. 218
- b. Hind wing with vein 5 present, but very weak; fore wing with vein 6 from over $\frac{2}{3}$ rd of areole; 7 stalked with 8, 9; areole about three times longer than broad; antennae bipectinate, branches nearly four times shaft, straight; palpi obliquely upturned, just reaching vertex; frons rounded (see also **15 b.**) **Phycitimorpha** p. 208
- 33 a.** Fore wing with 7, 8, 9, 10 stalked and from upper angle; 6 from upper angle or stalked with 7, 8, 9, 10 **34**
- b. Fore wing with 7 and 8 stalked for nearly half of 7, and from upper angle; 6 from before upper angle; 9 and 10 on a stalk of half of 10 and from before upper angle **Campyloctys** p. 219
- 34 a.** Fore wing with vein 6 on a long stalk with 7, 8, 9, 10; hind wing with veins 3 and 4 on a stalk of $\frac{1}{3}$ rd of 3 **Taeniopteryx** p. 212
- b. Fore wing with vein 6 very shortly stalked with 7, 8, 9, 10, or from upper angle together with this stalk; hind wing with 3 and 4 remote **Eurystaura** p. 216

Genus SCALMICAUDA.

Scalmicauda Holl. *Psyche*, vi. p. 439 (1893). Type *benga*.

Auriv. *Entomologisk Tidskrift*, p. 197 (1892).

Auriv. *Arkiv för Zoologi*, Band 2, No. 4, p. 5 (1904).

(Pl. I, figs. 1-5; Pl. II, figs. 1-5.)

Description from *albicostata* Hmps. n.

♂, ♀. Tongue short but present; palpi rather short, a little longer than length of eye, obliquely upturned, thickly scaled and with some long hair on first joint; first joint short, about one-third of palpus, curved; second joint cylindrical, straight, nearly two times first joint; third joint minute, completely hidden in hairs; eyes covered with hairs, rounded, rather large; antennae about half length of costa, usually curved, in ♂ bipectinate for about two-thirds, or as in *o'neili* bidentate for the same length and with a bundle of curved cilia at the end of each tooth; branches about three times shaft and ciliated forwardly; antennae in ♀ simple, ciliated; fore tibia with a hollow curved process reaching till end of tibia; mid tibia with terminal spurs; hind tibia with four spurs which end in a curved point; femora with long moderate hairs, fore tibia with a thick covering of hairs, mid and hind tibiae sparingly covered with hairs; tarsi with bristles on inner side, smoothly covered with hairs generally.

Fore wing rather long and narrow; costa nearly straight, curved towards apex, which is roundly pointed; termen oblique, gently curved between veins 3 and 7; tornus well rounded; inner margin excurved at middle; vein 1*b* faintly forked at base; 2 from $\frac{2}{3}$ th lower median; 3 from nearly $\frac{1}{4}$ th 2 to 4; 4 from lower angle; 5 from above middle of discocellulars which are outwardly oblique;

two short veinlets in the cell; 6 from about middle of areole, which is nearly as long as half vein 10; 7, 8, 9 stalked and from end of areole; 7 from stalk at $\frac{1}{3}$ rd of whole stalk, which is as long as $\frac{1}{2}$ distance end of areole to apex; free part of vein 10 from end of areole; 11 from upper median at $\frac{2}{3}$ rd, parallel to 12; 12 parallel to costa.

Hind wing sub-triangular; costa well curved; apex well rounded; termen oblique and well curved; tornus rounded; inner margin gently curved; 1 *a* and *b* somewhat curved, long; 2 from lower median at $\frac{3}{4}$ th; 3 from $\frac{3}{4}$ th distance 2 to 4; 4 from lower angle and curved; 5 from above $\frac{1}{2}$ discocellulars which are somewhat oblique inwardly and have a forked veinlet in the cell; 6 and 7 on a stalk of $\frac{1}{3}$ rd 7 and from upper angle; 8 curved upwards at base, then downwards and approximated to upper median, then curved upwards; a bar to vein 8 from just before middle of upper median. The hairs of the thorax have a tendency to produce a tuft, which is very long and thin in *heterogyna* and practically absent in *albicostata*; the abdomen has a brush of long hairs, which is however absent in *albicostata*. The description given by Holland is altogether insufficient to fix the genus and as the type of the genus is unknown to me, it may be that the characters given above do not apply to all species.

Aurivillius in *Arkiv för Zoologi* also remarks, that Holland's description is insufficient, and adds many useful characters which refer to *fuscinota*, all of which are found on the species I place in this genus. Hampson in *A.M.N.H.* 8. v. p. 492 places Aurivillius' species for certain in *Scalmicauda*, and in addition, gave me very useful information about the genus, also mentioning the hairy eyes, so that I have no doubt that my species are rightly placed here.

It is to be regretted, that generic descriptions are sometimes incomplete to such an extent, that it is impossible to recognise the genus with any certainty if the actual type species is not at hand. The original description should, I think, mention every character more or less readily observable and of distinctive value. This not only applies to genera but also to species.

The genus seems to be confined to Africa; three species have been described from South Africa to which I add a fourth.

They may be tabulated as follows:

- | | | | |
|------|--|---------------------|----------|
| 1 a. | A long, narrow thoracic tuft of hairs | heterogyna | |
| b. | No thoracic tuft at all, or if present not long and narrow | | 2 |
| 2 a. | White points at the angle of cell of fore wing; a black point in cell near base; white points at base of cilia | griseitincta | |
| b. | No white points on fore wing and no black point in cell near base | | 3 |
| 3 a. | Costa narrowly white, fore wing maroon-red, no orbicular, reniform or macula below lower median; hind wing in both sexes white; antennae of ♂ bipectinated for $\frac{2}{3}$ rd | albicostata | |
| b. | Costa of fore wing in ♂ broadly white, in ♀ this white is reduced to a triangular macula at end of post median line; a brown round orbicular, reniform and round macula below lower median and before vein 2; cilia tipped with white; antennae of ♂ bi-serrate for $\frac{2}{3}$ rd | o'neili. | |

SCALMICAUDA HETEROGYNA.

(Pl. I, fig. 2.)

Scalmicauda heterogyna Hmps. *A.M.N.H.* 8. v. p. 490 (1910).

I have a ♂ and a ♀ and have seen another ♀ which is in Mr Clark's collection, all in rather broken condition, but distinctly marked. They differ from the description in a few points: the brown rings around the orbicular and reniform

are continuous in one specimen, and the hind wings are whitish-yellow, not white. The process of the fore tibia is in this species similar to that of *albicostata*, but is less twisted and curved inwardly at the tip, while the covering of hairs is much more dense and thicker than in *albicostata*.

Hab. ♂, GILLETS (Natal), 15. 2. '17; ♀, Durban, 5. 5. '13, both in collection Janse; ♂ from Durban in collection Clark.

SCALMICAUDA GRISEITINCTA.

Scalmicauda griseitincta Hmps. *A.M.N.H.* 8. v. p. 492 (1910).

I have not met with this species yet.

SCALMICAUDA ALBICOSTATA.

(Pl. I, fig. 1; Pl. II, figs. 1-5.)

Scalmicauda albicostata Hmps. *A.M.N.H.* 8. v. p. 493 (1910).

My specimens agree well with the description, but the white edging on the costa of fore wing is very narrow; also the colouring of the antemedial line is more yellow and not whitish and in the ♂ the veins of the fore wing are ochreous in colour, a character not mentioned in the description. In a letter to me, Sir George Hampson mentions these characters also from his specimens, so there can be no doubt about my specimens belonging here.

Hab. UMVUMA (S. Rhodesia), 25. 12 '17; Salisbury (29. 2. '17; ♂ and ♀ bred by Father O'Neil¹.) One of these ♂s is very dark in colour and the white costa is hardly present. My ♂s have the antennae bipectinated for $\frac{2}{3}$ rd, the apical third being simple. The costa of the fore wing in the ♂ is less arched than in the ♀ and the antemedial and postmedial lines are more defined in the ♂ than in the ♀.

The thoracic tuft is in this species only indicated.

SCALMICAUDA O'NEILI spec. nov.

(Pl. XIII, figs. 1-3; Pl. I, figs. 4, 5.)

♂. Frons and tuft of antennae at front Sanford-brown (ii); hairs of palpi orange-rufous (ii); a line of cream coloured (xvi) hairs between the antennae and posterior part of tuft at base of antennae cream colour; vertex with deep olive-grey (li) hairs; thorax above, ground colour of fore wing at basal half and at costal region on apical half mars-yellow (iii); hairs on tibiae and femurs, underside of thorax, upper and under side of abdomen and terminal area of fore wing ochraceous-salmon (xv); two flat crests at base of abdomen dark vinaceous-drab (xiv), first crest with a tuft of cream coloured hairs in centre; hairs at side of last abdominal segments cream coloured; anal tuft of spathulated hairs dark, vinaceous-drab mixed with black; shaft of antennae covered with white scales and with teeth on inner and outer side for $\frac{2}{3}$ rd of shaft; rather long fasciculated, forwardly curved whitish hairs on each tooth.

Fore wing; a broad white fascia along costa from base to near apex filling space between costa and vein 12 and extended near apex to vein 10; sub-basal line indicated by some dark scaling near costa and below lower median; antemedial line faint, dark, most distinct below discal fold, angled inwardly at 1 b; a rounded blackish, macula, somewhat angled towards discocellulars, inner side with blackish scales, edge ill-defined by a blackish ring; orbicular large, angled inwardly on inner side, curved on outer side, coloured and defined

¹ Father O'Neil informs me that the caterpillar of this species feeds on *Brachystegia randi*.

as orbicular; postmedial line almost parallel to termen, cream coloured, curved at 8, nearly straight and very oblique to vein 4, then curved inwardly to vein 2, then curved outwardly to 1 a, then oblique to inner margin; just beyond it and near tornus a slight hind-marginal tuft of dark vinaceous-drab hairs and a broader similar tuft just before it; some dark and white scales beyond post-medial line at apex above vein 8; a sub-terminal series of black lunules between the veins from vein 1 b to 8; some black scaling beyond each lunule; cilia chamois (xxx), tipped with white from vein 3 to apex and getting mixed with dark scales towards tornus.

Hind wing: ground colour cartridge-buff (xxx), slightly tinged with pinkish-buff (xxix) on the veins and on inner marginal area; cilia cream-buff.

Under side: ground colour of both wings cream-buff; the costal fascia of fore wing cartridge-buff; fore wing tinged with vinaceous-buff (xl), thinly at inner marginal area; hind wing with the costa tinged with vinaceous-buff; cilia somewhat darker than on upper side.

♀. Ground colour of fore wing and thorax more vivid ochraceous-orange; all markings less dark, ferruginous (xiv); a costal ferruginous fascia, less broad than the corresponding white fascia of ♂; antemedial line more distinct, ferruginous, double and filled in with some whiter scales, incurved at discal fold and below 1 b; postmedial line less distinct, more curved between 2 and 5 and only clearly visible as far as vein 2; beyond it a white triangular macula at costa; sub-terminal lunules as in ♂; hind wing cartridge-buff, tinged with pinkish-cinnamon (xxix); under side of both wings deeply tinged with pinkish-cinnamon. Antennae simple; thoracic crest less pronounced, almost absent.

♀. *var.* Generally much darker, but lines and dark maculae obsolescent; thorax and colour of whole fore wing carob-brown (xiv); postmedial line very faint; white costal macula somewhat smaller; abdomen on upper and under sides cinnamon-rufous (xiv); hind wing on upper side and both wings on under side mikado-brown (xxix). This species comes close to *niveiplaga* Hmps. and *argenteomaculata* Aur.; from the former it differs mainly in the orbicular and reniform being more rounded instead of elliptical, the macula below orbicular being large and not a mere blackish spot, the different postmedial line and the white macula being triangular, not wedge-shaped. From the latter it differs mainly in the thoracic tuft, which is quite long and produced even in the ♀ of *argenteomaculata* while the tuft of *o'neili* is short, triangular in the ♂ and almost absent in the ♀.

Unfortunately of these two species only ♀s are known to me from description and it will be interesting to know if their ♂s will also have the broad white costal fascia.

Exp. ♂, 46 mm.; ♀, 56 mm.

Hab. SALISBURY, I. 5. '18; 19. 5. '18; var. 24. 2. '18, all bred by Father J. O'Neil, after whom I have much pleasure in naming this species. All in coll. Janse, kindly presented by Father O'Neil.

Genus ICHTHYURA.

(Pl. I, fig. 6; Pl. II, figs. 6-10.)

Ichthyura Hübn. *Verz. bek. Schmett.* p. 162 (1822).

Hmps. *Moths of India*, I. p. 172 (1892).

Packard. *Memoir of the Nat. Acad. of Sciences*, VII. p. 123 (1895).

Type *anastomosis*. Description from *roseotincta*.

♂, ♀. Proboscis very short; head bent downwards; frons rounded and with a tuft of hair; palpi obliquely upturned; first joint short and curved; second

joint somewhat curved on both ends, long, about three times first joint, cylindrical; third joint short, somewhat pointed; all joints with long hair in front, with scales and hairs at the sides; eyes moderate, oval and covered with hairs; antennae rather short, less than half of costa; shaft curved, bipectinate in both sexes; pectination four times shaft in ♂, two times in ♀, on under side forming a straight line and getting very short beyond $\frac{2}{3}$ rd of shaft; legs rather short, especially the fore legs; fore tibia of ♂ with a pointed process on inner side, as long as tibia and covered with long dense hairs on outer side; in ♀ the process is narrow and the hairs are shorter; tarsi short and with dense tufts of long hairs on outer side; mid tibia with terminal spurs, longest inner spur about $\frac{1}{3}$ rd of whole tibia, outer spur somewhat shorter; hind tibia with four spurs, outer spur shortest; tarsi of last pair of legs covered with moderate hairs; thorax with a distinct crest and some long hairs at base of abdomen.

Fore wing rather short; costa arched near base, then straight and curved towards apex; apex obtuse; outer margin erect, straight, curved towards tornus which is well rounded; inner margin curved at half; 1*b* well forked at base; 2 from beyond $\frac{3}{4}$ th lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle and much curved; 5 from $\frac{2}{3}$ rd discocellulars, which are erect and somewhat curved; 6 slightly stalked with stalk of 7, 8, 9, 10 which comes from upper angle; 7 from stalk at $\frac{1}{3}$ rd of 8; 8 to apex; 9 from 8 beyond $\frac{2}{3}$ rd of 8; 10 from stalk, 8, 9 at before middle of 8; 11 from upper median at $\frac{2}{3}$ th; 12 parallel to costa except near base where it is curved. Hind wing sub-triangular; costa well arched; apex rounded; outer margin oblique, well rounded at vein 3, somewhat incurved between 4 and 6, 2 and 3; tornus and inner margin rounded; 1*a* and 1*b* slightly curved; 2 from lower median at $\frac{2}{3}$ rd; 3 from $\frac{3}{4}$ th 2 to 4; 4 from lower angle; 5 absent, only a mere trace of it can be seen; discocellulars very oblique at lower half, then more erect; 6 and 7 stalked for about $\frac{1}{3}$ rd of 6; 7 well curved at tip; 8 slightly curved at base, then approximated to upper median beyond middle, but not touching it, then upcurved beyond $\frac{2}{3}$ rd and downwards towards tip.

Range: N. America, Europe, Asia, Africa.

The three South African species may be distinguished as follows:

- | | | |
|------|--|---------------------|
| 1 a. | Transverse lines almost absent; where the medial and postmedial lines should be the ground colour is slightly lighter; fore wing vinaceous-lilac, irrorated with morocco-red, especially at the costal area | |
| | | violacearia |
| b. | Transverse lines distinct; fore wing along the costa of ground colour or lighter | 2 |
| 2 a. | Tuft of thorax in front and hairs of frons mummy-brown; hind wing as dark as fore wing; apical part of fore wing buckthorn-brown; reniform oval; sub-terminal line consisting of rather irregularly placed spots | lentisignata |
| b. | Colour of thoracic tuft orange-cinnamon; hind wing lighter than fore wing; fore wing with the apical and terminal part lighter than ground colour; reniform round; sub-terminal line almost continuous | roseotincta |

ICHTHYURA LENTISIGNATA.

Ichthyura lentisignata Hmps. *A.M.N.H.* 8. v. p. 495 (1910).

I have one ♀ in my collection which agrees well with the description except for the oblique dark shade in the fore wing from postmedial line at

discal fold to termen at vein 3. I have seen another specimen in Mr E. E. Platt's collection, collected at Durban, in which the sub-terminal spots and the terminal black striae are entirely absent.

Hab. Natal.

Larva feeds on *Trimeria almifolia* Planch (E. E. Platt); pupates in silken cocoon between leaves of food plant.

ICHTHYURA ROSEOTINCTA spec. nov.

(Pl. XIII, fig. 4; Pl. I, fig. 6; Pl. II, figs. 6-10.)

♂, ♀. Ground colour of thorax and fore wing congo-pink (xxviii), of abdomen on both sides, thorax, wings on under side, hairs on hind wing on upper side and legs pale vinaceous-fawn (xl); tuft of thorax in front, palpi at sides and costal area of fore wing densely irrorated with orange-cinnamon (xxix); some blackish hairs mixed with vinaceous-fawn hairs on frons; antennae with shaft pale congo-pink and a few orange-cinnamon scales, branches Rood's brown (xviii). Fore wing, especially basal $\frac{2}{3}$ rd, irrorated with orange-cinnamon, terminal part only slightly, so as to have a light vinaceous-fawn (xl) tinge in certain light; sub-basal line outwardly oblique, straight from costa to lower median, then along lower median outwardly, then somewhat incurved and continued to inner margin; antemedial line from costa to inner margin nearly parallel to sub-basal, excurved between costa and $1b$, then straight and oblique to inner margin; medial line from near costa and just touching the reniform, which is large, round and brownish-drab (xlv), in ♀ less distinct; medial line then well incurved as far as sub-median fold, then straight and outwardly oblique to join postmedial line at $1b$; all these lines, a ring around the reniform and the postmedial line of ground colour; sub-basal line on inner side, antemedial line on outer side, and postmedial line on both sides rather darker edged with orange-cinnamon irroration; postmedial line nearly straight and inwardly oblique, slightly excurved at vein 6, gently incurved between 6 and sub-median fold, then somewhat excurved above $1b$ and joining median line; a sub-terminal slightly irregular, faint line, consisting of blackish scales and preceded by a line of ground colour, the blackish line somewhat excurved between 4 and beyond 3; cilia of ground colour, in ♂ tipped with black scales, in ♀ blackish at base.

Hind wing with costal area, terminal half, inner marginal area and lower median thinly irrorated with orange-cinnamon; cilia whitish with a few orange-cinnamon scales.

Under side: fore wing pale vinaceous-fawn; costa narrowly and termen broadly tinged with sayal-brown (xxix); cilia as on upper side; hind wing uniform pale vinaceous-fawn.

Exp. ♂, 32 mm.; ♀, 34 mm.

Hab. ♂ and ♀ type from Salisbury 8-10. 2. '17, bred by Mr R. Jack, who kindly presented three specimens to me.

ICHTHYURA VIOLACEARIA spec. nov.

(Pl. XIII, figs. 5, 6.)

♂. Head, palpi, thorax, hairs on legs and ground colour of fore wing vinaceous-lilac (xlv), more or less densely, but finely, irrorated with morocco-red (i); fore wing with the transverse lines of ground colour and only faintly visible on account of morocco-red irroration; this irroration is very dense before postmedial line between the costa and vein $1b$; sub-terminal line very

indistinct, oblique; antemedial line indistinct, preceded by a faint light line; medial line indistinct, morocco-red, straight from costa along discocellulars, then curved inwardly beyond origin of vein 2, then obliquely curved to post-medial line at inner margin; a faint dark round reniform beyond discocellulars; postmedial line slightly undulating, inwardly oblique, most distinct of all lines and preceded by a faint darker line of morocco-red; beyond this line the morocco-red irroration has practically ceased so that this area has a beautiful, shiny vinaceous-lilac tinge, which is more or less continued between 1*b* and inner margin; sub-terminal line, from costa to tornus, consists of some irregular morocco-red scaling between the veins; similarly the terminal line is indicated, but much more faintly; cilia vinaceous-lilac, gradually getting darker towards the tips; hind wing pure white, with the basal half hardly and the terminal half more densely irrorated with sorghum-brown (xxxix); cilia white.

Under side of both wings white; fore wing and abdomen tinged with vinaceous-tawny (xxviii); cilia as above; hind wing slightly irrorated with vinaceous-tawny along costal area, abdomen above fawn coloured (xl).

♀. Fore wing as in ♂ along inner margin and beyond sub-terminal line, but beyond medial line from below lower median a triangular patch of lobelia-violet (xxxvii) densely irrorated with morocco-red before and less densely beyond postmedial line, which passes through it; upper edge of this triangle incurved and on terminal side connected with a similarly coloured shading before sub-terminal line, this patch extends from vein 4 to vein 8; the medial corner of this triangle is connected to the rounded and more distinct reniform by an oblique fascia; area, as far as sub-terminal line, not occupied by the lobelia-violet colour, with the ground colour ochraceous-buff (xv) (as also indicated in one of the ♂s) and densely irrorated with morocco-red; hind wing of cream colour (xvi), terminal half ochraceous-buff and thickly irrorated with morocco-red; apical part of costa coloured like cilia of fore wing; cilia cream coloured with some dark scaling here and there.

♀. *var.* Ground colour of fore wing, head, thorax, abdomen and legs avellaneous (xl), somewhat violaceous on inner and terminal area of fore wing as indicated by the general markings of the typical ♀; here and there some lighter and darker irroration on the thorax and the fore wing; transverse lines and orbicular absent; cilia of both wings of same colour as the wings.

In this species the venation of the hind wing is slightly different from what it is in the other species, 3 is from $\frac{2}{3}$ rd 2 to 4, the stalk of 6, 7 is somewhat shorter, about $\frac{1}{3}$ th of 7; the typical ♀ and one ♂ also have four slight crests on the abdomen which are somewhat hidden in the long hairs in the ♂; the ♂ has also a forked anal tuft of hairs.

Exp. ♂, 33 mm.; ♀, 42 mm.; ♀ *var.*, 40 mm.

Hab. ♂ type, PINETOWN (Natal), 23. 6. '17; ♂ cotype, MALVERN (Natal), 30. 3. '17; ♀ type, KRANTZKLOOF (Natal), 12. 6. '16 (all bred by Mr E. E. Platt). ♀ *var.*, PRETORIA, 14. 7. '06 (bred, Janse).

Larva feeds on *Protea multibracteata* Phillips; pupates in a loose silken cocoon between the leaves of the food plant (E. E. Platt).

Genus PECTINOPHORA nov.

(Pl. I, fig. 7; Pl. II, figs. 11-17.)

Type *noctuidformis*.

♂. Proboscis well developed; palpi upturned, reaching vertex of head; first joint much curved and with long hairs in front; second joint about two times first joint, nearly straight, covered with hairs and scales, which are

rather long in front; third joint short, about half first joint, somewhat oblique; eyes large, rounded, naked; frons oblique and with a tuft of moderate stiff hairs; thorax without crests and covered with hairs and hairlike scales; abdomen with lateral tufts of hairs at each segment; antennae a little over half of costa, bipectinated till tip, branches about six times shaft, somewhat curved forwardly at the tips and ciliated on both sides; first joint of shaft with a tuft of hairs; fore tibia with a twisted process nearly reaching end of tibia and almost hidden in the long hairs; femurs of all legs and of fore legs especially covered with long hairs on inner side, with scales at the sides; two spurs on the mid tibia, four spurs on hind tibia; spurs about $\frac{1}{3}$ rd of tibia in length, outer spurs $\frac{1}{3}$ rd shorter than inner and all covered with hairs and hair-like scales and ending in a somewhat curved smooth point; tarsi with spines on inner side.

Fore wing broad, sub-triangular; costa straight; apex somewhat rounded; termen nearly erect, curved and somewhat sinuate; tornus rounded; inner margin with a round lobe at basal half on which are two triangular tufts of scales and a small tuft just beyond postmedial line; *1b* simple at base, curved; 2 from $\frac{2}{3}$ rd lower median, curved; 3 from $\frac{1}{3}$ th 2 to 4 and curved; 4 from lower angle, curved; 5 from just above middle of discocellulars; discocellulars outwardly oblique, nearly straight; 6 from below upper angle; areole long, rather narrow; 7 from end of areole; stalk of 8, 9, 10 from end of areole; 9 from just beyond half distance end of cell to apex; 10 from $\frac{1}{3}$ rd of stalk; 11 from about $\frac{2}{3}$ rd upper median; 12 parallel to costa. Hind wing triangular; costa well arched; apex rounded; outer margin very oblique and well rounded, slightly sinuate; tornus rounded; inner margin nearly straight except at *1a* where it is slightly lobed; *1a* straight, moderate; *1b* somewhat curved; 2 from well beyond half of lower median; 3 from $\frac{1}{3}$ th 2 to 4; 4 from lower angle; 5 rather weak and from above middle of discocellulars; discocellulars outwardly oblique; 6 and 7 stalked for $\frac{1}{5}$ th of whole of 6 and from upper angle; upper median well curved; 8 curved at base, then curved towards upper median at $\frac{1}{3}$ rd and running parallel with it till $\frac{2}{3}$ rd, beyond this it is connected with the upper median by a rather long oblique bar, then curved towards apex.

This genus is near to *Hyperaeschra* from which the fore wing differs in the more erect outer margin, shorter wing-length, the two tufts on the inner margin and veins 3 and 4 of both wings being farther apart and 6 of fore wing being remote from the areole. From *Lophopteryx* it differs in the upturned palpi, position of vein 6 of fore wing, and less sinuate outer margin.

PECTINOPHORA NOCTUIFORMIS spec. nov.

(Pl. XIII, fig. 7; Pl. I, fig. 7; Pl. II, figs. 11-17.)

♂. Hairs on head, thorax and fore legs, fore wing as far as postmedial line and along the whole costa shiny fuscous-black (xlvi); mid and hind legs fuscous-black; tarsi ringed with ivory-yellow (xxx); abdomen on upper and under side hair-brown (xlvi); fore wing with a faint basal black line; medial line single from costa to lower median, then double and black, double lines filled in with russet (xv) and preceded by some french-grey (lii) scales; the medial line is oblique from costa and rounded along discocellulars, where there is some black scaling, then oblique to inner margin at tuft of scales, forming a tooth inwardly just below lower median and at *1b*; both lines fuscous-black, preceded by some french-grey scales; two fine black lines in cell from near base to discocellulars, lower line shortest; a fine black line on terminal half of lower median and another below it from base to russet scaling and where the inner

median line is very faint; most veins indicated by black between medial and postmedial lines; postmedial line consisting of a series of four lines, from costa oblique to 7 where they are curved inwards to vein 5, somewhat excurred on vein 3 and then oblique to inner margin; first line black, second warm buff (xv), third fuscous from costa to vein 6, then indistinct to vein 4, then russet, fourth line french-grey, represented by some scales only from costa to vein 4; veins beyond postmedial line irregularly scaled with black and french-grey; costal area beyond postmedial line and above vein 7 fuscous-black; area between 7 and 2 russet, with a warm buff line in the middle which is dentated inwardly on the veins and followed by some warm buff sub-terminal lunules between veins 2 to 7, and edged terminally by some black scales; between 1 b and 2, and 7 to 9 these lunules are only represented by black scales; area below vein 2 french-grey; a very narrow sinuate black terminal line with french-grey points on end of veins; cilia fuscous-black. Hind wing cartridge-buff, terminal half thickly irrorated with fuscous; inner marginal area with long cream-buff (xxx) hairs; cilia fuscous, tipped with cartridge-buff scales.

Under side cartridge-buff; fore wing very densely irrorated and suffused with fuscous; hind wing with some fuscous irroration along costa; cilia as above but lighter; shaft of antennae fuscous-black, branches russet; abdomen at base with some fuscous-black long hairs in middle and cartridge-buff hairs at sides.

Exp. ♂ type, 36 mm.; 2 ♂ cotypes and 9 other ♂s.

Hab. All the specimens were collected at UMTALI (S. Rhodesia), from 5—15. 1. '18. I have seen no other specimens of this species in other collections.

In general appearance this species resembles very much the figure of *Lophopteryx saturata* given in Hampson's *Moths of India*, vol. 1. fig. 102, except that the hind wing of that species shows strigae at the tornus of the hind wing and of these not a trace is seen in *noctuiiformis*.

Genus LOPHOPTERYX.

(Pl. I, fig. 8; Pl. II, figs. 18—23.)

- Lophopteryx* Steph. *Ill. Brit. Ent. Haust.* II. p. 26 (1892). Type *camelina*.
 Hmpsn. *Moths of India*, I. p. 166.
 Spuler. *Schmett. Eur.* I. p. 98.
 Schaus. *Trans. Ent. Soc. Lond.* p. 328 (1901).
 Pack. *Mem. of the Nat. Acad. of Sciences*, VII. p. 154 (1895).

Description made from *L. uniformis*.

♀. Proboscis present but rather short; palpi short, porrect, just reaching frons, covered with scales, hairs and hair-like scales; first joint short; second joint about half length of palpus, slightly curved; third joint roundly pointed, nearly half of second joint; frons rounded; eyes naked, round, about as large as length of palpi; antennae with a small tuft at base; shaft short, less than half of costa, very much curved, bipectinated till tip; branches about three times shaft, bluntly pointed and covered with rather long cilia which stand rather far apart; fore tibia with a process reaching till end of tibia; this process is somewhat cylindrical and hollow at base, then, at before half its length it flattens and broadens so as to become leaf-like, then curved, with the apex roundly pointed, the outer side of the process is covered with scales and hairs and the edges of the leaf-like part have bristle-like hairs, the hollow side is towards the tibia; mid tibia with two spurs, hind tibia with median spurs as well; the longer inner spurs are about $\frac{1}{3}$ rd of tibia, the outer spur is about $\frac{1}{3}$ rd

shorter, they end in an acute inwardly curved point and the remainder length is covered with scale-like hairs; femora of all legs, especially those of hind legs, rather thinly clothed with long hairs; tibiae more thickly covered on outer side; tarsi of mid and hind legs with some bristles on inner side and covered with hairs and scales.

Fore wing broad; costa straight; curved at and beyond vein 11; apex rounded; termen erect, crenulate; tornus sharply rounded; inner margin with a large rounded lobe at basal half on which is a large tuft of hairs; another but smaller tuft of hairs beyond postmedial line; 1*b* somewhat curved and indistinctly forked at base; lower median curved upwardly; 2 from $\frac{2}{3}$ th lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle and well curved; 5 from middle of discocellulars and somewhat weak; discocellulars erect, curved below and above vein 5; 6 from areole at $\frac{2}{3}$ th of areole; areole very long, about half length of vein 10, narrow; 7 from end of areole; 8, 9, 10 stalked; 9 from 8 at $\frac{1}{3}$ rd whole length of 8; vein 10 from stalk of 8, 9 at little beyond areole; 11 from upper median at $\frac{2}{3}$ th, upper median curved upwards; 12 parallel to costa.

Hind wing sub-triangular; costa curved; apex well rounded; termen oblique, well rounded, crenulate; tornus rounded; inner margin straight; 1*a* and 1*b* slightly curved; 2 from lower median at $\frac{2}{3}$ th; 3 from $\frac{2}{3}$ th 2-4; 4 from lower angle, well curved; 5 rather weak and from above middle of discocellulars; upper discocellular erect, lower oblique and both somewhat curved; an indistinct veinlet into the cell beyond vein 5; 6 and 7 from upper angle, stalked for about length of upper discocellular; upper median well curved; 8 gently curved at base, then downwards to approach and run parallel with terminal half of upper median, then curved upwards to apex; at before half of upper median there is an indication of a bar on this vein and vein 8.

I have little doubt that my specimens have to come in this genus, though in this species the antennae are well pectinated, even in the ♀, while in the other species of *Lophopteryx* they are serrate in the ♂; all other characters agree so well, that I keep the South African species here. The figure of the wing venation given by Packard differs in a few characters from my specimens; it has the areole much shorter, 6 shortly stalked in the fore wing and no veinlet in the cell, and the inner margin has a pointed lobe; in the hind wing the outer and inner margins are not as straight and the stalk of 6, 7 is shorter in my specimens. The illustration of the fore leg differs from mine in the tarsi and the process being much shorter in the American species, but it is not possible to recognise the shape and structure of this process even in the denuded specimen.

LOPHOPTERYX UNIFORMIS.

(Pl I, fig. 8; Pl. II, figs. 18-23.)

Lophopteryx uniformis Swinh. *A.M.N.H.* 7. XIX. p. 208 (1907).

The description given by Swinhoe is rather short but fits my specimens in every respect, except that the dorsal side of the abdomen is not whitish tinged with pink in my specimens, but more yellow. There are, however, several details that can be seen which have been omitted. I therefore give a fairly full re-description of my specimens.

♀. Head, thorax, fore wing, tibiae and femora of all legs bone-brown (xl), the thorax and the fore wing here and there tinged with chestnut (ii); shaft of antennae bone-brown, pecten clay colour (xxix); abdomen above cinnamon-buff (xxix) slightly tinged with hair-brown (xlvi), on under side nearly entirely hair-brown; two white spots on meso-thorax. Fore wing with a white spot at base above 1*b* and a few white hairs below it; antemedial line blackish, pre-

ceded by antimony-yellow (xv) faint lunules and some scales of same colour, beyond it above lower median and as far as discocellulars, beginning at $\frac{1}{3}$ rd of costa, then well curved outwardly and then obliquely inwardly to inner margin, where it ends in a few antimony-yellow scales at base of first scale tooth; postmedial line blackish and followed by irregular antimony-yellow lunules and with some similar scaling before it between 2-4, and 5-6 and again beyond it between veins 3-4; the line begins at $\frac{2}{3}$ rd of costa, runs then nearly parallel to costa for half the distance to apex, then oblique and nearly straight to base of second scale-tooth, very much dentated outwardly at veins 2-8; sub-terminal line represented by a series of black spots between veins 3-8, preceded by some yellow scaling; cilia of ground colour, but with a lighter base. Hind wing cartridge-buff (xxx), exterior half gradually shaded with hair-brown, most intensely at outer margin; cilia cartridge-buff, tinged with hair-brown. Under side: tarsi cartridge-buff ringed with bone-brown; fore wing uniform hair-brown; cilia hair-brown at base, then bone-brown and with a few cartridge-buff scales between the veins indicating a semilunar line; hind wing as on upper side.

Exp. 62 mm.

Hab. UMTALI (S. Rhodesia), 9. I. '18 (Janse).

Genus PSEUDORETHONA.

(Pl. I, fig. 9; Pl. III, figs. 1-6.)

Type *albicans* Wlk.

Pseudorethona gen. nov.

♂, ♀. Proboscis very rudimentary; palpi short, scarcely as long as width of eye, porrect; first and second joints of equal length; third joint $\frac{1}{3}$ rd of second, globular, covered with long, spreading hairs; eyes large, rounded, glabrous; antennae bipectinate as in *Cerura* but branches shorter, about four times shaft, gradually getting shorter towards tip; basal part of shaft as in *Cerura*; fore tibia with a process as in *Cerura* but slightly shorter and more straight; mid tibia with two terminal pointed spurs of about $\frac{1}{4}$ th of tibia in length; hind tibia with two pairs of pointed spurs about $\frac{1}{3}$ rd of tibia in length; spurs rather long and thin, with two very short rows of short teeth near apex only; all legs covered with long, spreading hairs; tarsi with hairs and scales; mid and hind tibiae with small scale tufts at middle and terminus.

Fore wing rather long and narrow; costa evenly incurved; apex rounded; termen oblique, evenly curved; tornus well rounded; inner margin somewhat lobed near spur of *1b*; *1b* with a fork at base and a spur which, however, does not reach inner margin; 2 from $\frac{2}{3}$ th lower median; 3 from $\frac{2}{3}$ th distance 2 to 4; 4 from lower angle; 5 rather weak, from above middle of discocellulars and with an indication of a continued veinlet in the cell; 6 from end of areole, which is nearly 4 times the breadth; 7 from $\frac{1}{3}$ rd stalk of 8, 9; 8 and 9 on a stalk of $\frac{2}{3}$ rd 8, originating from end of areole; 10 from just before end of areole; 11 from $\frac{2}{3}$ rd upper median, somewhat curved inwardly near areole; 12 parallel to costa.

Hind wing sub-triangular; costa nearly straight; apex rounded; termen well rounded; tornus with a rounded lobe at *1b*; inner margin evenly curved; *1a* and *1b* nearly straight; 2 from lower median at $\frac{2}{3}$ rd; 3 and 4 from lower angle; 5 faint, but distinct, from well above middle of discocellulars; discocellulars oblique and faint; 6 and 7 on a stalk of nearly half of 6; 8 a little upcurved till $\frac{1}{3}$ rd upper median, where it has a little bulge to suggest rudiments of a bar, then approximated and parallel to near end of cell, then upcurved towards costa.

The type of this genus has been placed by Walker in *Rethona*, but Sir George Hampson kindly informed me that this genus, of which *strigosa* is the type, has to come in the **Limacodidae**. *R. albicans*, Wlk. was placed by Prof. Aurivillius in the genus *Cerura* when he identified some of my specimens, but the presence of four spurs on the hind tibiae is sufficient to remove this species from *Cerura*. I have therefore been obliged to create another genus for it.

There are, however, many points of resemblance between this genus and *Cerura*; the venation on the whole, the process of the fore tibia, the shape of the spurs, the pectination of the antennae and the type of marking on the fore wing all point to close relationship.

PSEUDORETHONA ALBICANS.

(Pl. I, fig. 9; Pl. III, figs. 1-6.)

Rethona albicans Wlk. *Cat. v. p.* 1043 (1855).

The description given by Walker is very short and much too vague, so I think it useful to re-describe the species.

♂. Whole insect pure white; hairs on frons, on palpi and at sides of head fuscous (xlvi); thorax, and fore wing at basal, medial area, and postmedial area above vein 6, light patch at apex and tornus tinged with pale dull green-yellow (xvii); lines on head, thorax and wings black; a few black scales on frons and before antennae; patagia and tegulae edged with black; a crest beyond each tegula and tipped with black; a central crest on metathorax also tipped with black; abdomen above hair-brown (xlvi). Fore wing with a broad basal line from costa till *1b*, dentate on the veins; a double sub-basal line from costa to inner margin, curved and much angled at the veins, space between them pure white; antemedial line double, more erect, very much angled and dentated on the veins, and space between them pure white, lines farther apart near costa than at inner margin; space between outer sub-basal line and inner antemedial line, densely irrorated with black except a round spot in the cell which is tinged with pale dull yellow-green; medial line double, broad near costa, as is the case in the outer antemedial line, then narrow; inner line parallel to outer antemedial as far as vein 2, then touching antemedial and forming between them a round spot tinged with the light greenish, a black irroration between the lines at inner margin; outer medial line curved outwards below costa touching outer side of orbicular, which consists of two black strigae filled in with the pale greenish, then almost straight to vein 2, then dentate inwardly on plical fold and *1b* and touching antemedial at inner margin; postmedial beginning as a broad oblique streak from before apex, which is sharply defined on the outer side, then a little narrower and less defined to near medial line at vein 4, then outwardly oblique to vein 2, then curved inwards to plical fold, then curved outwards above *1b*, then erect to inner margin; a black irroration beyond it reaching the termen between veins 7 and 2 except for a triangular patch from vein 7 to 6 which remains tinged with the pale green; a black irroration at tornus below plical fold; a black fine terminal line, rather thicker between the veins; cilia white, tinged with pale green and checkered with black between the veins.

Hind wing pure white, except some fuscous black scaling at the tornus; a fine fuscous-black terminal line interrupted by the white at the veins; cilia white.

Under side: wings, thorax and abdomen and hairs on legs pure white; tarsi black, ringed with white; fore wing with costa broadly edged with black and with some white irregular marks at basal, antemedial, medial, and postmedial areas; terminal half of wing from costa to vein 2 irrorated with fuscous, only

leaving an apical elongate white patch; both wings with a terminal black line; cilia of both wings as above; hind wing with a diffused fuscous costal shading at antemedial and medial areas; a well-defined costal postmedial fuscous patch; a faint fuscous striga on discocellulars and a very faint fuscous postmedial line.

♀. Like ♂, but postmedial line much more incurved and more densely irrorated with fuscous, hind wings tinged with cinnamon-brown (xv); all lines less defined; under side, the whole fore wing is suffused with cinnamon-brown except some terminal and apical white patches; hind wing with terminal half suffused with cinnamon-brown except near termen; and the postmedial line which is left white; basal half irrorated with cinnamon-brown; striga on discocellulars and terminal line cinnamon-brown.

Exp. ♂, 31 mm.; ♀, 37 mm.

Hab. I have this species from Pretoria, Oct., Febr.; Three Sisters (Barberton distr.), Febr.; from Natal, at Karkloof, Verulam, Umkomaas in Jan.; from S. Rhodesia, Umtali, Jan.

Larva feeds on *Trimeria alnifolia* Planch, and *Grewia lasiocarpa* E. M. Constructs a tough cocoon on stem of food plant (E. L. Clark).

Genus CERURA.

(Pl. I, fig. 10; Pl. III, figs. 7-9; Pl. V, figs. 1-3.)

Cerura Schrank. *Fauna Boica*, II. 2. Abth. p. 155 (1802). Type *furcula*.

Wlk. *Cat. v. p.* 982 (1855).

Hmps. *Moths of India*, I. p. 155 (1892).

Pack. *Mem. of the Nat. Acad. of Sciences*, VII. p. 263 (1895).

Meyr. *Handbook Brit. Lep.* p. 310 (1895).

Schaus. *Trans. Ent. Soc. Lond.* p. 288 (1901).

Spuler. *Schmett. Eur.* I. p. 91 (1908).

Description made of *spiritalis*.

♂, ♀. Proboscis almost absent; palpi short, about breadth of eye, porrect; first and second joint of equal length; third joint about $\frac{3}{4}$ th of second joint; all joints covered, especially first and second on under side, with long hairs; eyes large, round, glabrous; antennae nearly half of costa, bipectinate till tip; first joint of shaft sub-globular, with a tuft of long hairs on inner side, second joint without any pectination; branches six to eight times shaft, for about $\frac{2}{3}$ rd, apical third with shorter branches in both sexes, in ♀ the branches are often only three times shaft or less; branches broad in middle, pointed at the ends, rough on the surface and sparsely covered with short hairs, some bristle-like hairs at tip; fore tibia with process reaching beyond tibia; process curved at $\frac{2}{3}$ rd, covered on outer side with short hairs; mid and hind tibiae with one pair of terminal spurs only, which are sharply pointed and as long as $\frac{1}{3}$ rd of hind tibia; femora and tibiae covered with hair mixed with a few scales; two small tufts of scales at middle and end of mid and hind tibiae; tarsi densely covered with scales. Fore wing broad, over half; costa straight in ♂, or nearly so, often gently excurved in ♀; apex well rounded; termen even and gently curved; tornus curved; 1a forming a fork with 1b and continued as a spur to inner margin; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; discocellulars oblique; 5 from middle of discocellulars; 6 from middle of areole; 7 stalked with $\frac{1}{3}$ rd of stalk, 8, 9¹; 8 and 9 stalked for half

¹ In most other species of *Cerura* 7 comes from end of areole, but in *C. swierstrae* this vein comes in some specimens from end of areole and in others from beyond middle of areole, which is in that case usually longer.

of 8; 10 from well before upper angle, anastomosing with stalk of 7, 8, 9 to form an areole which is about four times as long as broad; 11 from upper median at before $\frac{5}{8}$ th; 12 almost parallel to costa.

Hind wing semicircular in shape; costa well arched; apex rounded; outer margin arched, slightly sinuate; tornus well rounded; inner margin straight; 1a and 1b nearly straight; 2 from $\frac{2}{3}$ rd lower median; 3 and 4 from lower angle¹; 4 curved; 5 from middle of discocellulars, which are erect; a distinct forked veinlet in cell; 6 and 7 on a stalk of nearly $\frac{1}{3}$ rd of 6; 8 almost parallel to upper median and approximated at before middle where both veins form a knob indicating a bar.

This genus has a good number of species in the Northern hemisphere and a few species are also found in South America and Australia. It is therefore interesting to note that not less than six species are now known from South Africa. The species of this genus are generally white or grey (*esmeralda* is light bluish-green) with black markings. The South African species may be tabulated as follows:

1 a.	Ground colour of fore wing light bluish-green	esmeralda	p. 172
b.	Ground colour of fore wing white		2
2 a.	Hind wing with a terminal dark band on upper or under side		3
b.	Hind wing without such a band		4
3 a.	Hind wing with terminal band on under side giving a dark shade on upper side	bifasciata	p. 171
b.	Hind wing with the terminal band on both sides	spiritalis	p. 173
4 a.	Base of fore wing till antemedial line suffused with black, postmedial line distinct, double	argentescens	p. 171
b.	Base of fore wing white, at most with a few black speckles; post-medial line indistinct or absent		5
5 a.	A distinct antemedial black band from costa to inner margin; cilia of both wings checkered with black scales	marshalli	p. 173
b.	No distinct antemedial line, at most some black scales at costa and inner margin; cilia white, though beyond the terminal black spots a few black scales may mix with the cilia	swierstrae	p. 173

CERURA ARGENTESCENS.

Cerura argentescens Hmspn. *A.M.N.H.* 8. v. p. 458 (1910).

Hab. Natal (Lidgeton). I have not seen this species yet².

CERURA BIFASCIATA spec. nov.

(Pl. XIII, fig. 8.)

♀. Head, thorax, base of abdomen on upper and nearly whole of abdomen on under side, and ground colour of wings on both sides pure white; frons at sides, hairs of palpi, and branches of antennae fuscous-black (xlvii); shaft of

¹ Some specimens of *spiritalis* have 3 from $\frac{4}{5}$ th 2 to 4 and 4 from lower angle, while some have one wing normal and the other wing abnormal.

² Since writing the above, I have seen two specimens in the collection of the South African Museum, one of which bears a label in Hampson's own handwriting and is identified as *Cerura argentescens* Hmspn. These specimens agree in every way with the description, but on the other hand it is not a *Cerura* as the median spurs are present on the hind legs, and I find it moreover indistinguishable from *Pavarethona hierax* ♂. The other specimen is also clearly a ♀ of *P. hierax*. I consequently think that *C. argentescens* has to be sunk as a synonym of *P. hierax*, though I refrain from doing so until I have seen the type specimen.

antennae with white scales; legs ringed with fuscous-black; a small black spot on head in the middle near the thorax; a transverse fascia on thorax of black and shiny bluish slate-black (xlvi) scales; a similar but narrower line of scales on metathorax; abdomen on upper side, except basal part, covered with bluish slate-black scales mixed with a few whitish scales.

Fore wing: all markings black; a few black scales at base below lower median and a small sub-basal patch on lower median; an interrupted sub-basal line from costa to inner margin, interrupted in cell and at $1b$; an antemedial black broad fascia from costa to inner margin, inner edge indented at vein 12 and upper median, excurved in cell, indented at plical fold and $1b$, outer edge somewhat excurved at the veins with a sharp dent at plical fold and below $1b$; medial line indicated by a black spot at costa and three strigae below lower median; a black mark below it, a faint striga in cell and a distinct black striga on discocellulars; postmedial line interrupted, double and irregular, beginning on costa as a broad triangular patch, then both lines faint on the veins, angled outwards at 3, 2 and $1b$; a sub-terminal distinct, continuous, irregular line from apex to near tornus, broad from costa to beyond vein 3, then narrow except between $1b$ and 2 where it becomes confluent with a fuscous (xlvi) irroration at tornus, very much angled inwards at vein 8, 6, 5, 4 and between 2 and $1b$, outwards above vein 8, between 6 and 7, and just above 3, 2, $1b$; a terminal series of spots, two between $1b$ and 2, and one between the veins 2 to 9; these spots are continued with brussels-brown (iii) scales into the cilia which are otherwise white.

Hind wing: an elongate patch of black scales on middle of $1b$; a fuscous diffused mark at upper discocellular; some fuscous-black scales at tornus; in the cilia broad fuscous patches between the veins, two between $1b$ and 2, and one between the other veins; markings of under side somewhat visible through the white on upper side.

Under side white. Fore wing on costa with elongate markings on basal, sub-basal, antemedial, medial and a postmedial area, first mark black, the others gradually becoming fuscous; a diffused fuscous mark at discocellulars and a diffusion in cell before it; postmedial band broad, ill-defined, fuscous, ending just beyond vein 2; sub-terminal and terminal area thickly suffused with fuscous, except at costa where a few white marks are left; checkered fuscous patches on cilia as on upper side. Hind wing with a black discocellular ovate patch, indicating postmedial line, from costa till vein 5; terminal band and cilia as on fore wing; abdomen with last segment covered with fuscous-black hairs.

The palpi of this species are very short.

Exp. 56 mm.

Hab. Southern Rhodesia. Only one specimen, kindly presented to my collection by the Bulawayo Museum, unfortunately without further data as to locality or date of collection.

The species comes perhaps nearest to *spiritalis*.

CERURA ESMERALDA.

Cerura esmeralda Hmps. *A.M.N.H.* 8. v. p. 458 (1910).

Two ♂s and two ♀s in my collection from Pretoria, Febr. '14; Oct. '09, '14; Salisbury, Febr. '16.

Mr K. Munro bred the Pretoria specimens from caterpillars feeding on *Protea* spec. Bred by E. E. Platt on *Protea hirta* Klotzsch, and *P. multi-bracteata* Phillips. Constructs a tough cocoon on stem of food plant.

CERURA MARSHALLI.

Cerura marshalli Hmpsn. *A.M.N.H.* 8. v. p. 456 (1910).

I have a ♂ and ♀, both from Salisbury, bred in Dec. '12 by Mr R. Jack, who kindly presented them to me. In the ♂ the outer margin of the fore wing is very oblique and the wing very narrow.

CERURA SPIRITALIS.

(Pl. I, fig. 10; Pl. III, figs. 7-9; Pl. V, figs. 1-3.)

Cerura spiritalis Dist. *A.M.N.H.* 7. III. p. 464 (1899).

This species I have from Rietfontein 57 (Pretoria distr.) bred by me in Jan. 1905; also from Barberton (collected by Miss de Beer); White River (Cooke); Pretoria in Nov. '14 (Munro); only one ♀ is known to me.

CERURA SWIERSTRAE.

Cerura swierstrae Dist. *Entom.* xxxv. p. 213 (1902).

Two ♂s and one ♀ in my collection from Johannesburg (Sept. '04, Cooke); Pretoria (Sept. '08, Munro); Umkomaas, Natal, Jan. '14 (Janse).

The three specimens are practically the same, but the Johannesburg specimen has more black in the inner margin of the fore wing.

Genus PARARETHONA nov.

(Pl. I, figs. 11-16.)

Type *Desmeocraera hierax* Dist.

♂, ♀. Proboscis rudimentary; palpi short, porrect, not reaching vertex, covered with long spreading hairs; first joint as long as second and third joint together; third joint almost half of second joint; eyes large, glabrous, rounded; frons with a tuft of long hairs; antennae about half of costa in length, bipectinated for $\frac{3}{4}$ th their length, then ciliated; branches in ♂ about ten times shaft, ciliated on both sides, in ♀ about eight times shaft, in both sexes the branches are in shape as in *Cerura* and *Pseudorethona*; base of shaft globular and with a long tuft of hair in front; fore legs with a bluntly rounded straight process, nearly reaching till end of tibia; mid legs with two spurs; hind legs with four spurs of nearly equal length; shape of spurs as in *Cerura* and *Pseudorethona*, only more pointed and more strongly serrate on inner side and the serrae in two rows; in all legs the femurs and tibiae are covered with long spreading hairs. Fore wing in ♂ rather narrow and triangular, costa nearly straight, apex slightly rounded, termen oblique, slightly rounded, tornus rounded, inner margin nearly straight; in ♀ the fore wing is broader, costa gently arched, termen less oblique; 1 b with a fork of $\frac{1}{3}$ rd; vein 2 from $\frac{3}{4}$ th lower median; 3 from $\frac{2}{3}$ rd distance 2 to 4; 4 from lower angle; discocellulars oblique, incurved between 4 and 5; 5 from below lower angle; 6 from towards end of areole (in three ♂ specimens it is from stalk 7, 8, 9; in one ♂ specimen the areole is absent in left wing and present in the right wing, 6, 7, 8, 9, 10 are then stalked); 7 stalked with 8, 9 for $\frac{1}{3}$ th of its length; 8 and 9 on a stalk of over half of vein 8, originating from end of areole; 10 from $\frac{3}{4}$ th areole; 11 from before $\frac{2}{3}$ rd upper median; 12 parallel to costa. Hind wing triangular with the corners well rounded; costa well arched; termen very oblique and well rounded; inner margin well rounded; 1 a and 1 b slightly curved; 2 from $\frac{2}{3}$ rd lower median; 3 and 4 from lower angle;

discocellulars angled between 4 and 5; 5 from above middle of discocellulars; 6 and 7 on a stalk of nearly half of 6; 8 first curved upwards, then approximated to upper median for terminal half, but not connected with it by a bar.

This genus is evidently related to *Cerura* and *Pseudorethona* and probably a parallel development of the former. It differs from *Cerura* in having 4 spurs on the hind legs and from *Pseudorethona* in the absence of the tuft of scales on the mid and hind tibiae, absence of the spur on *1b* in fore wing; the branches of the antennae being longer but not reaching towards tip; in first joint of palpi being longer than second joint.

Only one species is known to me for this genus, which was placed by Distant in the genus *Desmeocraera*. From this genus it differs, however, in the following details: presence of areole, origin of vein 6, palpi, and other minor points.

PARARETHONA HIERAX.

(Pl. I, figs. 11-16.)

Desmeocraera hierax Dist. *A.M.N.H.* 6. xx. p. 204 (1897).

Dist. *Insecta Transv.* iv. p. 88, Pl. IV, figs. 3, 4.

In front of me are three ♂s belonging to the Transvaal Museum, which have been identified by Distant shortly after the description was made of a specimen which has the discoidal spot missing. This spot is mentioned in the description, but is absent in the figure. There are several other points in which the description and the figures do not correspond, but the figures are for certain identical with my specimens. The terminal dark, fuscous colour on the abdomen (though not shown in the ♂ figure, in which the abdomen is evidently greasy) is very characteristic for this species, though not mentioned in the description by Distant. I have no doubt that my specimens belong here, though I have only two ♀s, in addition to the ♂s mentioned above, which are quite like fig. 4, and are both from Pretoria. I have also a variety of this species, two ♂s and one ♀, while a ♂ of this var. is also in the Transvaal Museum collection.

Pararethona hierax, var. *dissimilis* var. nov.

♂. Head and palpi with long fuscous (xlvi) hairs; branches of antennae fuscous; vertex of head, thorax on upper and under side, hairs on femurs and tibiae fuscous mixed with pale green-yellow (v); abdomen on upper side for $\frac{1}{3}$ rd and towards terminus, and the whole of the abdomen on the under side with pale drab-grey (xlvi) hairs; about $\frac{2}{3}$ rd of abdomen on upper side with hair-brown (xlvi) hairs.

Wings on upper and under side white; base, as far as sub-basal line, sparsely irrorated with cinnamon-drab (xlvi) scales; sub-basal line double, inner one cinnamon-drab, outer line black, dentate inwardly at upper median, below lower median and *1b*; antemedial line black, with a pale yellow-green shade beyond it, curved outwardly between costa and upper median, angled outwardly between lower median and *1b* and towards inner margin; space between sub-basal and antemedial lines thickly irrorated with hair-brown scales and sparingly irrorated with black scales; postmedial line double, black, excurved at vein 6 and 3, incurved at 5 and 2, then to before tornus; space between antemedial and postmedial lines sparingly irrorated with hair-brown scales; at costa four dark markings and the irroration more dense; a dark irroration beyond postmedial line at costa and tornus; indications of a subterminal line of hair-brown irroration; a more sparing irroration over the whole area beyond postmedial line; terminal line black, somewhat interrupted at the veins, where there is a dark inwardly black shading; cilia white with hair-brown scales at base.

Hind wing with a few hair-brown scales as costa; a fuscous terminal line, interrupted at the veins; a black patch at tornus and an oblique faint fuscous shading above it; cilia pure white.

Under side: costa of fore wing thickly irrorated with fuscous, except towards apex, where there are 4 white patches; nearly the whole area irrorated with hair-brown; only the terminal line present; hind wing with a hair-brown mark from costa to fork of veins 6, 7; otherwise as on upper side.

♀. Like ♂, but irroration more black; band between sub-basal and ante-medial lines much darker and a dark shading beyond postmedial line; a distinct fuscous medial line, angled outwards below upper median and lower angle; a black patch of scales at discocellulars between 4 and 5; a white sub-terminal shading, angled outwards at the veins; a white band against the terminal black line; cilia checkered with fuscous and with a distinct basal line; hind wing thickly irrorated with hair-brown except at basal area; cilia checkered with fuscous scales.

Under side: fore wing uniform fuscous; black spot indicated; hind wing with a medial faint fuscous band and with a broad postmedial band parallel to termen; cilia as on upper side.

Exp. ♂, 41-39 mm.; ♀, 44 mm.

Hab. ♂ type from New Hanover, 8. '13 (Hardenberg); cotypes, Umkomaas, 14. 1. '14 (Janse); Nelspruit, 10. '17 (Dr Breyer); ♀ type from Bulwer (near Durban), 30. 5. '14 (bred by E. E. Platt).

Another ♂ from Emangeni (S. Rhodesia), 19. 1. '18 (Janse) and a ♀ from Rietvlei (Natal), 1. '18.

The two ♂ cotypes have vein 6 of fore wing stalked with 7, 8, 9.

Genus ANTHEUA.

(Pl. I, figs. 17-20; Pl. III, figs. 10-30.)

Antheua Wlk. *Cat.* III. pp. 687, 766 (1855). Type *tricolor*¹.

Hmps. *Moths of India*, 1. p. 145.

Dist. *Ins. Transv.* IV. p. 91.

Sirenopyga Wllgrn. *Öfv. Vet. Akad. Förh.* xv. p. 210 (1858).

Description from *tricolor*.

♂, ♀. Proboscis present, moderate; palpi somewhat upturned, short, just reaching frons, densely covered at front and sides with long hairs, mixed with some scales; first and second joint about equal in length; third joint very small, about $\frac{1}{3}$ rd of second joint; eyes large, rounded and naked; antennae of ♂ bipectinated for $\frac{2}{3}$ rd of shaft, branches shortening rather suddenly, terminal third becoming serrate; branches about two times shaft, each branch has fasciculated cilia at its end and is ciliated on the anterior side; in ♀ the antennae are simple and ciliated on both sides (in some species, as *bicolor* and *simplex*, the branches are longer, about three times shaft, while in *bicolor* the branches become *gradually* shorter towards tip); a tuft of long hairs on front of first joint of shaft; fore tibia with a process as long as, or slightly longer than, tibia; process in *tricolor* rather broad and pointed, in all species more or less hollow above on inner side, then becoming flattened and often twisted, the flat side being against the tibia, a row of bristles on edge of keel-shaped part as shown in fig. of *aurifodinae*; process thickly covered with hairs and some scales, as

¹ This is the type species according to Hampson, but Walker describes the species *simplex* first, so unless Walker has somewhere especially stated that *tricolor* is the type, I think *simplex* should be considered the type of the genus.

are the tibiae themselves; spines on the inner side of the tarsi, tarsi ending in a rather long claw; femora and tibiae of all legs with long dense hairs; mid tibia with two spurs, hind tibia with four spurs; spurs rather short and stout, covered with appressed hairs and scale-like hairs, and ending in a somewhat inwardly curved naked point which is provided with two rows of teeth (this curved point is rather long in *aurifodinae*).

Fore wing rather broad, sub-triangular, costa nearly straight, apex rounded, outer margin erect, straight, *slightly* sinuate, tornus rounded, inner margin nearly straight and without tufts; *1b* forked at base; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{3}{4}$ th 2 to 4; 4 well curved and from lower angle; 5 from middle of discocellulars; discocellulars erect and curved; 6 from middle of areole, which is long and narrow, nearly half length of vein 10, in some species (*simplex*) longer¹; 7 from before end of areole; 8, 9, 10 stalked, or 8, 9 stalked, and 10 from the areole; 8 from 9 at $\frac{2}{3}$ rd of 9; 10 from stalk of 8, 9 beyond half of 10, which originates near upper angle, thus making the areole very narrow; 11 from $\frac{2}{3}$ rd upper median; 12 parallel to costa.

Hind wing broad, triangular, costa somewhat curved, apex well rounded towards vein 7, outer margin well arched, slightly sinuate, tornus well rounded, inner margin somewhat arched; *1b* curved; 2 from just beyond $\frac{1}{2}$ of lower median; 3 from near lower angle; 4 from lower angle; 5 from above $\frac{1}{2}$ of discocellulars, which are inwardly oblique; 6 and 7 on a stalk of over $\frac{1}{3}$ rd of 6 and from upper angle; 8 parallel with, and approximated to, upper median for nearly whole length of median vein; no bar in *tricolor*, but some species show an indication of it.

Seven species have been placed in this genus, from which I remove *spurcata*, which I place in the genus *Zana*, and I think *aurifodinae* should be placed here, and so should *encausta*.

I have not been able to secure the description of Walker's *extenuata*, but it is probable that the description would not have helped much in recognising the species.

The species may be tabulated as follows:

1 a.	Fore wing with ground colour dark grey; hind wing yellowish	bicolor	p. 180
b.	Fore wing with ground colour light grey; hind wing light fuscous		
		peringueyi	p. 182
c.	Fore wing with ground colour light or dark yellow		2
2 a.	Fore wing with antemedial and postmedial series of orange dots		3
b.	Fore wing without such dots		4
3 a.	Fore wing bright yellow; antemedial spots 4; postmedial spots 7		
		croceipuncta	p. 178
b.	Fore wing pale yellow, antemedial spots 3, postmedial spots 7		
		basipuncta	p. 178
c.	Fore wing yellowish white; antemedial spots 3; postmedial spots 7		
		albida	p. 178
4 a.	Hind wing white		5
b.	Hind wing not white		8
5 a.	Fore wing densely irrorated with black and fuscous, especially along costa, medial fold and inner marginal area	mixta	p. 182
b.	Fore wing with no fuscous or black irroration along costa or inner margin		6

¹ There is a tendency in the areole to disappear, either through anastomosis of vein 7 and stalk of 8, 9 or of vein 10 with stalk 8, 9; this coalescence is found in the same species with normal specimens and generally veins 6-10 seem to be in a state of flux in this genus. There are even more varieties than those given in the figures and these are mentioned with each species where they occur.

- 6 a. Fore wing straw-yellow and with small black spots near base and at postmedial area **dimorpha** p. 180
 b. Fore wing pale or bright yellow, no black spots at basal or postmedial area **7**
- 7 a. Fore wing glossy pale yellow with spaces between the veins more or less filled with deep olive-buff **simplex** p. 177
 b. Fore wing bright yellow with three longitudinal fascia, a short one near apex below vein 8, a longer one below vein 7, and a long one from base to outer margin below vein 4 **aurifodinae** p. 179
- 8 a. Fore wing bright yellow, with diffused black scales in medial area below the cell and a few black scales indicating postmedial line **tricolor** p. 179
 b. Fore wing bright yellow and with brown markings **9**
- 9 a. A brown patch at base, and a medial brown patch below cell and vein 4 **consanguinea** p. 180
 b. Three broad fasciae on fore wing which touch each other at sub-terminal area, apical fascia short, from below apex oblique to vein 5 at $\frac{3}{4}$ rd, then again to outer margin at vein 4; second fascia from near base to outer margin below lower median and vein 4, filling whole space till vein 2; third fascia along inner margin nearly as far as 1 b **encausta** p. 179

A. ANTENNÆ OF FEMALE BIPECTINATE.

ANTHEUA SIMPLEX.

(Pl. I, fig. 18; Pl. III, fig. 26.)

Antheua simplex Wlk. *Cat.* III. p. 766 (1855).Dist. *Ins. Transv.* IV. p. 91, Pl. VIII, f. 11.*Sirenyopyga ephippiata* Wllgrn. *Wien. Ent. Monats.* IV. p. 164 (1860).Wllgrn. *Köngl. Vet. Akad. Handl.* 2. Bd. v. No. 4, p. 52 (1865).

I have specimens in my collection which vary considerably in intensity of colouration, ranging from with light yellow fore wing and white hind wing to an olive-lake (xvi) fore wing and light greyish olive (xlvi) hind wing. The antennae of the ♀s are with rather long pectination. A considerable variation is found in the venation of the fore wing as shown in the following table:

3 ♂s, 2 ♀s, as given in illustration; 6 from before middle of areole, 7 from end of areole; 10 from well before end of areole.

1 ♂, 6 as above; 7 from end of areole; 10 from before end of areole.

1 ♂, 6 as above; 7 as above; 10 from end of areole.

1 ♂, 1 ♀, 6 as above; 7 from stalk 8, 9; 10 as above.

1 ♂, 6 from $\frac{3}{4}$ rd of areole; 7 as above; 10 as above.

1 ♂, 6 as above; 7 as above; 10 from before end of areole.

1 ♂, *right wing*. 6 from middle of areole; 7 shortly stalked with 8, 9; 10 from before end of areole.

left wing. 6 free from angle of cell; 7 on a long stalk with 8, 9; 10 anastomosing with stalk 7, 8, 9, to form the areole.

This shows clearly that the position of vein 6 is of no use in separating the genus *Antheua* from *Zana* and *Cleapa* and perhaps other allied genera, as done by Sir George Hampson, and that the way in which vein 10 comes out of the areole is also far from constant. I do not think that any of these characters can be used for certain grouping of genera, as is done by Schaus in his paper in the *Tr. E. S. L.* 1901, p. 260.

This species is found all over South Africa. I have it in my collection from Pretoria, Middelburg, Waterval onder (Transvaal); New Hanover, Karkloof, Sarnia, Umkomaas, Verulam (Natal); Eshowe, and Melmoth (Zululand); in Oct., Nov., Dec., Jan.

Larva feeds on *Desmodium incanum* D.C. (E. E. Platt).

ANTHEUA CROCEIPUNCTA.

(Pl. I, fig. 19; Pl. III, figs. 19-23.)

Antheua croceipuncta Hmps. *A.M.N.H.* 8. v. p. 174 (1910).

I have hardly any doubt that this species and the following two are really the same specifically. Practically the only differences given consist of different intensity of colouration of head, thorax, wings and legs, absence of basal spots in *croceipuncta*, which are present in the other two species, a missing spot in *basipuncta*, present in the remaining two species. It is not stated which spot the missing one is but I suspect it to be the one on the upper median as this is the smallest of all and has a tendency to become smaller. One of my bright specimens has only 6 postmedial spots, the one on vein 5 being absolutely absent, without a trace of it, and which is certainly of the same species as my other specimens that have the 7 spots.

I have 5 specimens in my collection, 4 ♀s and one ♂, in which the coloration gradually merges from bright yellow into yellowish-white; of these the bright yellow ♀s have 2 basal spots (which are not mentioned for *croceipuncta*) and the lighter ♀ as well as the still lighter ♂ shows not a trace of it. They are all from the same locality (Salisbury), the bright coloured specimens being caught by myself at the end of December; the light coloured specimens were collected by Father O'Neil on Nov. 29th and in December, 1915. I have no doubt that my light coloured specimens have bleached either in nature or after collecting. The same gradual change of yellow may also be found in *tricolor* as this yellow readily fades in strong sunlight. The specimens I caught must have been quite fresh when collected and were the finest specimens Father O'Neil had seen up to that time; they were perhaps of the second brood.

My bright ♀s have the hind wings above and both wings on the under side coloured drab (xlvi) but the light coloured ♀ is only irrorated with drab on the upper side and slightly tinged with this colour on the under side. The ♂ is tinged with light orange-yellow (iii) and the under side is yellowish-white.

Of course, not having seen the type specimens, I cannot be certain, but with my specimens before me I have no doubt as to *basipuncta* and *albida* being co-specific to *croceipuncta*.

One of the ♀s has vein 6 of fore wing from angle of cell and not from the areole as is the case with the others, while another ♀ has the left wing normal and the right wing without the areole, so that 6, 7, 8, 9 are stalked and vein 10 is free from upper median. The antennae have in both sexes nearly equally long pectinations.

ANTHEUA BASIPUNCTA.

Antheua basipuncta Hmps. *A.M.N.H.* 8. v. p. 474 (1910).

ANTHEUA ALBIDA.

Antheua albida Hmps. *A.M.N.H.* 8. v. p. 475 (1910).

B. ANTENNAE OF FEMALE SIMPLE.

ANTHEUA TRICOLOR.

(Pl. I, fig. 17; Pl. III, figs. 10-15.)

Antheua tricolor Wlk. *Cat.* III. p. 688 (1855).Feld. *Reise. Nov.* IV. Pl. XCIV, fig. 7 (1874).(var.) Dist. *Ins. Transv.* IV. p. 92, Pl. VIII, fig. 13.*A. varia* Wlk. *Cat.* III. p. 766 (1855).Dist. *Ins. Transv.* IV. p. 92.

I do not think that there is any doubt about *A. varia* being the same as *A. tricolor*, the latter being a rather old and bleached specimen or perhaps a lighter coloured variety. The description of *A. varia* corresponds best with a fresh specimen. The figure given by Distant is also of a bleached specimen. A fresh specimen has the fore wing brighter yellow and the hind wing much darker, in such a case the black scaling in the fore wing (not shown in the figure) is more prominent. These intense black scales are found below the lower median, usually only between veins 2 and 3, but sometimes also before 2 and beyond 3; several of my specimens have a postmedial series of black spots from above vein 2 or 3, erect to vein 6, then a few scales obliquely towards apex. These spots are often reduced to a few scales only, and are often altogether missing in perfectly fresh specimens. The more intense yellow the fore wings are, the more black there is on the fore wing. Only the ♀ appears to have a black patch on the abdomen on upper side at the last two segments.

This species seems to be well distributed over South Africa. I have it from: Sarnia, Durban, Umkomaas (Natal); Nkwaleni (Zululand); Emangeni, Umvuma (S. Rhodesia), and it is also recorded from Waterval onder (Transvaal). Caught in July, Oct., Jan., Dec.

ANTHEUA AURIFODINAE.

(Pl. III, figs. 27-30.)

Rigema aurifodinae Dist. *Entom.* XXXV. p. 213 (1902).Dist. *Ins. Transv.* IV. p. 91, Pl. VIII, fig. 7.

I see very little reason for placing this species in the genus *Rigema*, the similarity in wing *pattern* being the only one, and even this character is not very pronounced. The shape of the fore wing is, however, that of a typical *Antheua* and the bar between the upper median and vein 8 of hind wing, which is well developed in *Rigema*, is absent in *aurifodinae*. Antennae, palpi and process of fore tibia are as in *Antheua*, though the stalk of 6, 7 in hind wing is a little longer. The hairs on the thorax are rather long and shaggy and not short as in *Antheua*, and there is a tendency to crestforming as in *Rigema*. I have this fine species from Beynspoort, Tweefontein (Transv.); Durban, Karkloof (Natal); Umvuma (S. Rhodesia); in Dec., Jan.

ANTHEUA ENCAUSTA.

(Pl. III, figs. 16-18.)

Dinara encausta Hmps. *A.M.N.H.* 8. v. p. 476 (1910).

I fail to see why this species has been placed in the genus *Dinara*, a genus which Hampson in his *Moths of India*, vol. 1. gives as a synonym of *Anticyra*. The differences between *Antheua* and that genus given on p. 144 are that the ♂ antennae are fasciculated and not bipectinated to apex, that vein 6 is

from beyond end of cell in *Anticyra* and from angle of cell in *Antheua*, that vein 9 is anastomosing with 8 to form the areole, while in *Antheua* 9 and 10 are anastomosing with 8 to form the areole. The figures given for both genera show a number of mistakes. Fig. 87 for *Anticyra* is supposed to be a ♂, but according to the frenulum it is a ♀; vein 10 is anastomosing with stalk of 7, 8, 9 to form the areole, just as is given for *Antheua*. Fig. 88 has vein 6 from the areole and not from the angle of the cell as it should be in *Antheua*, while one of the veins 8-10 is missing; in both figures a bar is given between vein 8 and upper median. As illustrated before, the position of veins 6-10 in the fore wing is extremely variable in species evidently belonging to *Antheua*, and can hardly be used alone as a distinction between genera. My specimens of *encausta*, however, have a venation as given in my figure of *A. tricolor*, in fact the only difference I can find is in the hind wing, which has 3 and 4 from a point and a slight bar at $\frac{1}{3}$ rd between the upper median and vein 8. The antennae of the ♂ are bipectinate for $\frac{1}{3}$ rd of shaft, as in *A. tricolor*, and the wing colouration and pattern indicate close relationship to *consanguinea*.

I have several specimens of this species, including a ♀, from Umtali and Salisbury (S. Rhodesia), in Dec., and Jan.

ANTHEUA CONSANGUINEA.

Antheua consanguinea Dist. *Ins. Transv.* iv. p. 92, Pl. VIII, fig. 12 (1903).

Apparently only one specimen, a ♀, has been discovered so far, caught at Lydenburg; I have not met with this species yet, nor have I seen it in any of the South African collections.

ANTHEUA BICOLOR.

(Pl. I, fig. 20; Pl. III, figs. 24, 25.)

Chadisra bicolor Dist. *A.M.N.H.* 7. iv. p. 360 (1899).

Dist. *Ins. Transv.* iv. p. 93, Pl. IV, fig. 10.

Osica verulama Beth.-Baker. *A.M.N.H.* 8. II. p. 257 (1908).

Why this species has been placed in *Chadisra* is a puzzle to me. The general heavy build, the rather broad fore wing and erect outer margin, the absence of the scale-like ridge of hairs on the mid and hind tibiae, the short second joint of the palpi, all this points to *Antheua*, in fact the only point of resemblance to *Chadisra* I can find is the dark scaling at tornus of hind wing, which, however, is never as pronounced as in *Chadisra*, in some cases even, it is just represented by a dark edging along the outer margin and this is never the case in *Chadisra*.

Larva feeds on *Rhus villosa* L.f.; autumn larva hibernates in the caterpillar stage in its cocoon (E. E. Platt).

This species seems to have a wide range in South Africa. I have it from Pretoria, Three Sisters, Waterval onder, White river, Bultfontein (Transvaal); New Hanover, Karkloof, Umkomaas (Natal); Nkwaleni (Zululand); Emangeni (S. Rhodesia), in Oct., Jan., March.

ANTHEUA DIMORPHA.

(Pl. XIII, fig. 10; Pl. XIV, fig. 2; Pl. I, fig. 25; Pl. IV, figs. 14-17.)

♂. Hairs on head, thorax on upper and under side and palpi on front Pinard-yellow (iv); palpi at sides with black hairs; abdomen above and branches of antennae yellow ochre (xv); abdomen on under side Naples-yellow (xvi);

fore wing on upper side straw-yellow (xvi); two small sub-basal black spots one on vein 12, and one just below lower median; antemedial line represented by some black scales on vein 1*b*, lower median, discal fold, upper median and vein 12; some black scales in, beyond and below cell; two black strigae at end of cell; a postmedial series of small black spots, curved outwardly at vein 7, inwardly at vein 5 and sub-median fold and from vein 4 oblique to $\frac{3}{4}$ th of inner margin; the spots are on veins 1*b* to 8 and on sub-median fold; a few black scales on sub-terminal area here and there between the veins; between the veins from costa to tornus a series of terminal strigae; cilia gradually getting white. Hind wing pure white with a few fuscous scales on origin of veins 3 and 4, and lower discocellular; cilia white. Fore wing and hind wing on under side white; fore wing with a medial patch between veins 4 to 7 irrorated with fuscous scales; hairs on legs marguerite-yellow (xxx) mixed on fore femur and tibia with fuscous hairs. On the cotype very little of the black scales can be seen, the specimen is in rather worn condition and not as well preserved as the type.

Branches of antennae to apex and about four times shaft; areole of fore wing exceedingly short and broad for an *Antheua*, but according to the other characters it appears to come in this genus.

♀. Like ♂, but without a trace of the antemedial spots and with more medial black scaling. Hind wing with some medial cinnamon-brown (xv) irroration.

The proboscis is very weak but present in the ♂; in the ♀ the proboscis is entirely absent and vein 5 of the hind wing is very weak, almost absent.

Exp. ♂, 44 mm.; ♀, 44 mm.

Hab. ♂ type from the Ermelo district (collected by Miss Forbes) in coll. Transvaal Museum; ♂ cotypes from Durban and Charlestown, in coll. S. A. Museum and coll. Janse. ♀ in coll. Janse, bred by E. E. Platt in Sept. 1915, at Durban.

Larvae feed on *Tephrosia macropoda* E. M. Very common at Durban in Oct.—Nov. 1914, but mostly parasitized. They construct a tough glutinated silken cocoon in the earth, and pupation is delayed for several months. Single brooded; the moths appearing in September (E. E. Platt.)

ANTHEUA DIMORPHA var. *brunnea* nov.

(Pl. XIV, fig. 1.)

♀. Hairs on head, palpi, thorax, legs, abdomen on under side, and ground colour of fore wing cinnamon-brown (xv); abdomen above antimony-yellow (xv), at sides light buff (xv); shaft of antennae with cinnamon-brown scales, branches maize-yellow (iv); fore wing uniform cinnamon-brown; a few sub-basal black scales above and below lower median; three bigger antemedial black spots on vein 12, lower median and 1*b*; a black irroration in cell beyond it till well before discocellulars and another black scaling on discocellulars, indicating the reniform; a postmedial series of black outwardly angulated spots on veins 1*b* to stalk of 8, 9, 10; a sub-terminal series of inwardly angulated black spots between the veins from above 1*b* to vein 8, almost parallel to termen, a little further from termen near apex than near tornus; some terminal black scales between the veins above 1*b* to 8; cilia of ground-colour, a little lighter at base.

This and the typical form were reared from the same batch of caterpillars. Mr Platt kindly gave me the following information: "Feeds on *Tephrosia macropoda* E. M.; the larvae were very common at Clare Estate, Durban, in Oct.—Nov. 1914, but most of them were parasitized. I have not met with them

since. They construct a tough glutinated silken cocoon in the earth and pupation is delayed for several months. Single brooded. The moths appearing in September."

Mr Platt has in his collection a brown ♂ and ♀.

ANTHEUA PERINGUEYI spec. nov.¹

♂, ♀. Head and thorax with fuscous (xlvi) and white hairs almost equally mixed, so as to produce a dark grey colour when not viewed with a magnifying glass and of the same tint as the general colour of the forewings; abdomen avellaneous (xl); thorax in ♀ with a small tuft of scales on mesothorax; fore wing whitish, rather densely irrorated with fuscous, especially at base and along costa; indications of a dentate fuscous medial line; a fuscous striga at end of cell; an outwardly dentate postmedial line, indistinct from costa to vein 7, then more distinct till vein 2, then indistinct; indications of a sub-terminal diffused irregular line; a distinct zigzag terminal line; cilia have general colour of fore wing. Hind wing light buff, distal part densely irrorated with fuscous and a medial line indicated by a fuscous irroration

Under side: both wings whitish; fore wing with a rather dense fuscous shading between postmedial and sub-terminal lines, broad near costa where it has two small, white, oblique, strigae and gradually getting more narrow till it ceases beyond vein 2; hind wing with medial line indicated by a fuscous irroration; some fuscous irroration beyond it along costa till near tornus.

Antennae bipectinated in ♂ till the tip; in ♀ simple; branches antimony-yellow (xv).

Exp. ♂, 40 mm.; ♀, 46 mm.

Hab. Capetown, March 1917 (P. C. Keytel).

♂ type in S. African museum; ♀ cotype in coll. Janse.

ANTHEUA MIXTA spec. nov.

(Pl. XIII, fig. 9.)

♂, ♀. Frons of head and thorax on under side apricot-yellow (iv); thorax above, hairs on palpi and legs on outer side marguerite-yellow (xxx), on palpi mixed with black hairs; tibiae on inner side covered with black hairs mixed with white; tarsi black ringed with white; a stripe on each side of thorax on upper side and hairs covering first segment of abdomen buff-yellow (iv), abdomen on upper side (except the last two segments, which are ringed black and buff-yellow) ochraceous-orange (xv); a lateral black line, checkered with whitish on abdomen; abdomen white on under side; branches of antennae ochraceous-orange.

Fore wing white and with broad fasciae, consisting of black and fuscous (xlvi) scales which are thickly covered with marguerite-yellow hair-like scales, so as to give a greyish tinge to the fasciae; costal fascia from base to apex, as broad as from costa to a little below upper median and having a whitish fascia between veins 7 and 8; second dark fascia from discocellulars to outer margin and filling the whole space from costal fascia between veins 5 to 7; a short, triangular terminal fascia of ground colour between veins 5 and 6; third fascia from base of wing to outer margin, joining the costal fascia till well beyond base and forming a straight edge in cell above the lower median, then along vein 4 for half that vein, then above vein 4 to outer margin; lower edge is well below lower median and vein 2 and parallel to discal

¹ This species was unfortunately not on hand at the time when the coloured figures were made, so that it was impossible to figure this species.

fold; two short, white, sub-triangular outer marginal fascia between 2 and 3, 3 and 4; fourth inner marginal fascia from base to tornus, extending to near discal fold; inner margin with a whitish edging; cilia white, checkered with a bunch of black scales on each side of veins 1*b* to 8, but remaining white just opposite the veins. Hind wing with buff-yellow hairs on inner margin; some fuscous scaling on veins 2 to 8 at terminal area; an indistinct black terminal line; cilia white and checkered as in fore wing.

Under side of both wings white and with a terminal black line and some dark scaling on the veins at terminal area.

♀. Of stouter build; the antennae are unfortunately missing in my specimen, but are probably simple as in the ♂ the branches are already very short, only a little over thickness of shaft.

The areole of the fore wing is in this species normal.

Exp. ♂, 48 mm.; ♀, 53 mm.

Hab. ♂ type from Charlestown (Natal) in coll. Janse; ♀ cotype from Likhoele (Basutoland), collected by Dieterlin, in coll. S. African Museum.

Species omitted: *A. spurcata* Wlk. = *Eutimia marpissa* Wllgrn., which I place in the genus *Zana*.

Genus DESMEOCRAERA.

(Pl. I, fig. 21; Pl. IV, figs. 1-12.)

Desmeocraera Wllgrn. *Köngl. Vet. Akad. Handl.* 2. Bd. v. No. 4, p. 52 (1865).

Auriv. Öfv. Vet. Akad. Förh. No. 9, p. 1050 (1900).

Type *interpellatrix*. Description from *interpellatrix*.

♂, ♀. Proboscis almost absent; palpi upturned, reaching vertex of head; first joint short, about $\frac{1}{4}$ th of second joint; second joint long, curved at base, gradually tapering; third joint very minute, in some species absent; all joints covered with rather short hairs and scales; eyes rounded, large, naked; frons rounded, covered with hairs and scales; antennae in ♂ about $\frac{2}{3}$ rd of costa in length, in ♀ only $\frac{1}{4}$ th; basal joint globular and with a tuft of hairs and scales in front; bipectinated for $\frac{1}{3}$ th, then serrate; pectination rather long, in middle about 5 times shaft; each branch with a terminal bristle and ciliated anteriorly; fore legs with a rather narrow, somewhat pointed process, reaching till end of tibia; mid tibia with two spurs as long as $\frac{1}{4}$ th of tibia; spurs with a terminal serrate edge on inner side and covered with hairs; hind legs with four spurs, about $\frac{1}{3}$ rd of tibia and in structure as on middle legs; all femora covered with long hairs; tibia of fore leg with hairs and scales, of other legs with hairs only; tarsi with dense, short, stout hairs.

Fore wing sub-triangular, costa almost straight, well curved towards apex, outer margin somewhat rounded, oblique, inner margin straight, apex and tornus rounded; 1*b* forked; 2 from just beyond $\frac{2}{3}$ rd lower median; 3 from before lower angle; 4 from angle; 5 from middle of discocellulars, which are straight and erect; 6 from upper angle or more or less stalked with 7, 8, 9, 10; stalk from upper angle; 8 from just beyond $\frac{1}{3}$ rd of 7; 9 from before $\frac{2}{3}$ rd of 8; 10 from middle of origin of 7 and 8; 11 from beyond $\frac{3}{4}$ th upper median; 12 straight, parallel to costa. Hind wing somewhat circular; costa, termen and inner margin well curved; apex and tornus well rounded; 1*a* and 1*b* straight; 2 from $\frac{2}{3}$ rd lower median; 3 from just before lower angle; 4 from angle; 5 from above middle of discocellulars, which are oblique; 6 and 7 on a stalk of $\frac{1}{2}$ of 6; 8 free, first upcurved, then curved towards upper median and parallel to it till near upper angle, then curved towards costa.

The species placed by me in this genus were placed by nearly all authors

in the genus *Stauropus*. All species known to me differ, however, from *Stauropus*, in having four spurs on the hind legs, having vein 10 of fore wing from beyond vein 7, having vein 8 of hind wing not touching the upper median, as it does in *Stauropus* for over half of cell, and in having rather long and upturned palpi. I only keep *mediata* Wlk. in *Stauropus*. A ♀ specimen of *Desmeocraera interpellatrix* in my collection has been identified by Prof. Aurivillius and the same distinguished entomologist drew my attention to the fact that *atriguttata* and *calliope* have to be placed in *Desmeocraera* on account of the four spurs on the hind legs. As the type of *D. interpellatrix* Wllgrn. is probably in the Stockholm Museum and the species is apparently well known to Prof. Aurivillius, I have no doubt that his identification is correct, though I cannot confirm this for certain on strength of the description. It is true, that my three specimens agree well with the description, but the description is of course far from complete. The only difference of importance is, that the ground colour of my specimens is not grey, but greyish green; seeing, however, that this green colour is not easily preserved, it is quite well possible that Wallengren's specimens were rather faded.

Desmeocraera hierax Dist. has to be taken out of this genus and has to come in the genus *Pararethona* as the wing venation and other structural characters show little direct relationship to *Desmeocraera* and why Distant has placed it there is a mystery to me.

Key to the South African species:

- | | | |
|------|--|------------------------------|
| 1 a. | Ground colour of fore wing green or irrorated with green | 2 |
| b. | Ground colour of fore wing white, irrorated with grey or with brown, or ground colour greyish-green | 9 |
| 2 a. | Ground colour of fore wing malachite-green (xxxii), orbicular and reniform defined by narrow silvery white lines; a fuscous sub-terminal patch between veins 5 and 6; some silvery white edging on sub-terminal, antemedial, medial and postmedial lines | calliope p. 186 |
| b. | Fore wing not malachite-green, but lighter | 3 |
| 3 a. | Sub-terminal line represented by a more or less irregular fine, often faint line | 5 |
| b. | Sub-terminal line represented by spots between the veins only | 4 |
| 4 a. | All markings on the fore wing somewhat diffused, sub-terminal spots most clearly defined of all; postmedial line very diffused; wing thickly irrorated with biscay-green (xvii); hind wing brownish | atriguttata p. 186 |
| b. | Markings on the fore wings sharply defined and edged with white, post-medial line well defined, narrow, black and very irregular; ground colour of fore wing pale olivine (xxxii); hind wing whitish thalassina p. 187 | |
| 5 a. | Ground colour of fore wing water-green (xli), three diffused rounded spots, the smallest at lower angle, a larger one before this on lower median and one below lower median at before origin of vein 2 | tripuncta p. 189 |
| b. | No diffused spots on fore wing as mentioned above; ground colour of fore wing water-green or slightly darker | 6 |
| 6 a. | All markings, except sub-terminal line, very diffused, almost absent; antemedial and postmedial lines indicated by some dark scales, mixed with yellow scales; indications of white-ringed orbicular and reniform | vernalis p. 186 |
| b. | Markings more distinct; no yellow scales mixed with it | 7 |
| 7 a. | Postmedial area irrorated with dark green scales; hind wing of ♂ whitish, veins beyond the sub-terminal line not streaked with black | interpellatrix p. 185 |

- b. Postmedial area not much darker than ground colour; hind wing of ♂ thickly irrorated with brown; black streaks beyond sub-terminal line as far as termen 8
- 8 a. Hind wing with white streaks on the cilia; a distinct black irroration in middle of postmedial area, edged on the inner side by yellowish-green, on outer side by white, below vein 4 connected with a black patch to sub-terminal line and below vein 2 with a black streak towards base, which is interrupted by green at antemedial area
- platti** p. 190
- b. Cilia of hind wings not interrupted by white streaks; no distinct irroration beyond postmedial line, though in the ♀ there is an indication of it; there is, however, no dark patch below vein 4; often there is a continuous or interrupted black streak, broad or narrow, below lower median from base to postmedial line; hind wing with postmedial line distinctly indicated near costa by two black streaks as far as vein 6 **varia** p. 187
- 9 a. Sub-basal line obliquely outwards towards costa 10
- b. Sub-basal line obliquely outwards towards inner margin 11
- c. No sub-basal line at all **incana** p. 189
- 10 a. Ground colour of fore wing thickly irrorated with drab (xlvi); some yellow hairs at ante- and postmedial lines; hind wing irrorated with brown **vernalis** p. 186
- b. Ground colour of fore wing light mouse-grey (li); hind wing pure white except at costa near apex **canescens** p. 188
- 11 a. Sub-basal area rather dark, well defined by a double black line; cilia greyish; pecten of antennae in ♂ over 3 times shaft **basalis** p. 186
- b. No black lines defining sub-basal area, which is of ground colour, but defined by a single brown line; cilia of hind wing almost white; pectination of antennae in ♂ short, about two times shaft 12
- 12 a. Antemedial line nearly straight; postmedial line somewhat incurved at lower angle of cell, beyond which it just passes **steniptera** p. 191
- b. Antemedial line angled outwards in cell, inwards at submedian fold; postmedial line curved outwards beyond vein 3, passing a good distance beyond discocellulars **pergrisea** p. 191

DESMEOCRAERA INTERPELLATRIX.

(Pl. I, fig. 21; Pl. IV, figs. 1-3.)

Stauropus interpellatrix Wllgrn. *Wien. Ent. Monats.* iv. p. 164 (1860).*Desmeocraera interpellatrix* Wllgrn. *Kongl. Vet. Akad. Handl.* 2. Bd. v. No. 4, p. 52 (1865).

I have two ♂s of this species in my collection, one from White River (Aug. 1909), and one from Krantzklouf (Aug. 1916); and one ♀ from Eshowe (Zululand) (Jan. 1916). One ♀ in Transvaal Museum from Durban (Febr. 1908).

As remarked in my notes on the genus, my specimens are not grey, but tinged with olivine (xxxii) green; however, for reasons given above, I have little doubt as to the correctness of the identification, as moreover, the species is very distinct from any of the other species known to me.

The third joint of the palpus of this species is very minute and only visible between the hairs at high magnification.

DESMEOCRAERA ATRIGUTTATA.

(Pl. IV, fig. 8.)

Stauropus atriguttata Hmps. *A.M.N.H.* 8. v. p. 465 (1910).

I have ♂s and ♀s in my collection from Durban caught in Jan. and May. Sir George Hampson only described the ♀ of this species. The ♂ is much smaller, 44–50 mm., but is otherwise identical with the ♀. Both sexes have a green patch of hairs and scales on the upper side of the last abdominal segments, a character not mentioned in the description.

Larva feeds on *Mimusops obovata* Sond., *Chrysophyllum viridifolium* Wood, and *C. natalense* Sond, pupates in a brittle earthen cocoon (E. E. Platt).

The third joint of the palpus is longer than in *interpellatrix*.

DESMEOCRAERA CALLIOPE.

(Pl. IV, figs. 4, 5.)

Stauropus calliope Hmps. *A.M.N.H.* 8. v. p. 466 (1910).*Desmeocraera ianthina* Aur. iv.

Only ♀s in my collection, all from Durban in Jan., March, June, November.

The spurs of the hind legs, especially the terminal pair, are shorter, more curved at the point and the toothed ridge is not visible; the third joint of the palpi also seems to be absent in this species.

Larva feeds on *Chrysophyllum viridifolium* Wood (H. A. Green).

Spins a cocoon in chinks of bark, some distance from the ground (E. E. Platt).

DESMEOCRAERA VERNALIS.

(Pl. IV, fig. 6.)

Desmeocraera vernalis Dist. *A.M.N.H.* 6. xx. p. 205 (1897).Dist. *Ins. Transv.* iv. p. 89, Pl. IV, fig. 1.

My specimens agree well with the quite good figure and the rather poor description and I have seen a specimen identified by Distant himself. I find that the yellow scales mixed with black scales on the antemedial and post-medial lines, as mentioned in the key, are very reliable characters. In the grey variety these scales are also present though the lines themselves are very indistinct in that form. The general ground colour of the fore wings is not green, but greyish.

Hab. In coll. Transvaal Museum from Durban in Sept. and Nov., and from Pretoria in Jan.

Larva feeds on *Combretum apiculatum* Sond., pupates in a brittle earthen cocoon (E. E. Platt).

In coll. Janse from Durban (March); Karkloof (Jan.); Waterval onder (Nov.); Barberton (Nov.); Eshowe (Zululand) (Jan.).

DESMEOCRAERA BASALIS.

Desmeocraera basalis Dist. *A.M.N.H.* 7. iv. p. 361 (1899).Dist. *Ins. Transv.* iv. p. 89, Pl. IV, fig. 14.

Three specimens, one in the Transvaal Museum and two in my own collection, agree well with the figure except that the sub-basal lines do not go deeply inwards at vein 1*b* as shown in the illustration. One of my specimens

(from Emangeni) shows the basal patch rather lighter than the ground colour of the fore wing and not darker as in other specimens and as shown in illustration.

The description given by Distant is much too vague and if no good figure was given and the species was not as strikingly marked as it is, I would not have been certain of my identification. In my key several useful characters are given, but the direction of the sub-basal line, being oblique *outwardly* towards inner margin and the area before it being filled in with almost black scales, separate this species at once from the grey form of *vernalis* for which it might be mistaken, especially as *basalis* has also yellow scales between the black scales. The costa of the fore wing is also less curved at the base and the termen is more oblique than in *vernalis*.

Hab. In Transvaal Museum one ♂ from Nelspruit (Nov. 1917, Dr H. G. Breyer); in coll. Janse 3 ♂s from S. Rhodesia. (Emangeni, Jan. 1918; Umvuma, Dec.)

DESMEOCRAERA THALASSINA.

(Pl. IV, fig. 9.)

Stauropus thalassina Hmps. *A.M.N.H.* 8. v. p. 470 (1910).

My two ♀ specimens agree in every respect with the description and both specimens come from the recorded locality (Salisbury, bred by Father O'Neil in March and May).

Father O'Neil kindly sent me a drawing of the caterpillar from which the specimens were bred. This larva had 6 long front legs and four pairs of abdominal legs on the 3rd to 6th abdominal segments; the first and second abdominal segments had each a short hump and the last abdominal segments were turned up and the very last segment ended in two bristles as long as the breadth of that segment and placed in the shape of a V. It pupated for 20 days.

The front tarsi of the moth show some brushes of spreading hairs which are not found in any other species of this genus, also the palpi are shorter and have *spreading* hairs.

DESMEOCRAERA VARIA spec. nov.

(Pl. XIII, figs. 11, 12, 13; Pl. IV, fig. 7.)

♂. Thorax, ground colour of fore wing and costal area of hind wing, water-green (xli); vertex of head, palpi in front, legs, meso- and metathorax and abdomen on the under side cartridge-buff (xxx); sides of palpi, hairs of prothorax on under side, on tibia and femurs of fore legs and rings on tarsi of all legs natal-brown (xl); abdomen on upper side except the terminal segments and the remainder of the hind wings on upper side verona-brown (xxix); terminal segments of abdomen water-green; at base of abdomen a tuft of water-green hairs and scales mixed with black scales and hairs on the sides; shaft of antennae with white and natal-brown scales; branches clay colour (xxix).

Fore wing with all lines black, in some specimens beginning at costa with a natal-brown patch; sub-basal line confluent with basal line and erect till lower median, then excurved below lower median till antemedial line, some white and dark green scales beyond it; antemedial line double, very irregular and often obsolete, inner line heaviest, outer line thinner and preceded by a white line; a whitish patch beyond it below lower median; medial line absent from costa to vein 2, then faint and dentate on *1 b*; orbicular and reniform edged with white scales; postmedial line double, very irregular and much dentated on the veins, excurved at vein 7, incurved between 7 and 4, then erect to inner margin; space between the lines at veins 2 to 4 filled in with cinnamon-buff

scales and whitish scales beyond it; three costal blackish patches beyond postmedial line and some black scales below these patches; sub-terminal line distinct, narrow, irregular and from 1*b* to 8, incurved between 4 and 6, indented at 2, 3 and 1*b* where it has some black scales at the tornus; some black strigae from termen to near sub-terminal line on veins 2 to 8; cilia consisting of black and brown scales, checkered with cartridge-buff scales at the veins. Hind wing with a postmedial double line of black scales from costa to vein 6, inner line well defined, outer one very diffused; cilia uniform of natal-brown and cartridge-buff scales.

Under side: the whole fore wing, except inner marginal area, cartridge-buff, irrorated thickly with cinnamon-brown (xv); hind wing cartridge-buff, with some cinnamon-brown scales near apex; cilia of fore wing with cinnamon-brown tips, cilia of hind wing of ground colour. In some ♂ specimens the dark irroration at postmedial area is very much as in ♀ and a well-defined outer whitish line is present beyond the black sub-terminal line. In others again the antemedial, medial and postmedial lines are very obsolete.

♀. Like ♂, but more dark irroration in fore wing beyond postmedial lines, and here and there more chromium-green (xxxii) scales; whitish scales also more pronounced and more raised; postmedial dark irroration edged on the outer side by a crenulate whitish line, inwardly dentate on the veins; black basal line below the lower median continued till beyond postmedial line. In hind wing the irroration is more dense and extended till the inner margin. On the under side the hind wing is as much irrorated as in the fore wing. One ♀ cotype (in Transvaal Museum) has the postmedial patches between veins 2 and 4 dark.

Exp. ♂ type, 38 mm.; ♀ type, 50 mm.

Hab. ♂ type from Durban, 21. 9. '10 (Leigh); ♀ type, Durban, 18. 9. '14 (bred by E. E. Platt); cotypes and other specimens from the same locality in April, July, Oct. and Nov.

Probably very close to *octoginta*, but differs from it in the black streak of the median fold not going beyond postmedial line, in the presence of black streaks on the veins from sub-terminal line to outer margin, and a few other characters.

Var. ♂, ♀. Differs from the typical form in having a black, broad fascia at median fold as far as postmedial line; all other markings rather darker. Bred by E. E. Platt in Sept. and Nov. at Durban. Since drawing up the above description I received from Mr Platt some more material, all reared by him from the same batch of eggs. This material consists of 2 typical ♀s which in no point differ from the type except that they are somewhat smaller; the other 4 specimens consist of 2 pairs of the variety, one pair of which is in Mr Platt's collection, the others were kindly presented by him to me. These varieties are also like the types except one ♂, which has the antemedial and medial lines rather distinctly marked at the costal area, the medial line being indicated by two black spots, one on upper and one on lower median.

Larva feeds on *Mimusops obovata* Sond., and *M. discolor* Sond., pupates in a brittle earthen cocoon (E. E. Platt).

DESMEOCRAERA CANESCENS spec. nov.

(Pl. XIII, fig. 14.)

♂. Head, thorax, abdomen and fore wing pale olive-grey (li) mixed with mouse-grey (li); palpi at sides fuscous; hind wing on upper side, wings and body on under side and hairs of legs white; tarsi ringed with testaceous (xxviii),

on inner side cinnamon-buff (xxix); branches of antennae saccardo's umber (xxix); indications of sub-basal, antemedial, medial and postmedial lines, parallel to each other and inwardly oblique from costa to inner margin; sub-basal line as far as median fold only; all these lines consist of black scales, mixed with a few yellow scales; sub-terminal line well defined, shaded with lighter grey on outer side, dentate at each vein and at median fold; some olive-grey irroration on costa of hind wing at postmedial area and cilia as far as vein 6; a faint grey terminal line; cilia of both wings of ground colour. Fore wing on under side white, except for some grey irroration at costa and outer margin.

Exp. 38 mm.

Hab. Type and cotype. Emangeni (S. Rhodesia), 18. 1. '18. Janse.

Six specimens in all, of which two specimens are from Umvuma (S. Rhodesia), 25. 1. '17, Janse.

DESMEOCRAERA INCANA spec. nov.

♂, ♀. Head and thorax covered with white and mikado-brown (xxix) hairs; abdomen cream-buff (xxx); fore wing at costal and inner marginal area and whole region beyond postmedial line covered with white and mikado-brown hair-like scales mixed with black scales; remaining central area, except the veins, covered with hazel (xiv) scales; veins broadly covered with white scales mixed with black; a faint auburn (ii) postmedial line, dentate outwardly on the veins; a sub-terminal series of auburn spots between the veins from apex to vein 3, then becoming a faint line to tornus; cilia white, mixed with some drab (xlvi) scales. Hind wing whitish; a drab mark at end of cell, and beyond this the whole wing is irrorated with drab, most densely towards termen and on the veins; cilia white, with basal part tinged with drab. Under side: fore wing densely irrorated with wood-brown (xl) especially along costa; hind wing white, irrorated with wood-brown, rather densely along costa and termen. Thorax and abdomen on under side and legs with white and mikado-brown hairs. Antennae of ♂ with branches till the tip, which are about four times the shaft and cream-buff in colour; in ♀ shortly bipectinate, branches as long as thickness of shaft.

Exp. ♂, 38 mm.; ♀, 59 mm.

Hab. ♂ type from Nggeleni (W. Pondoland), 7. 2. '07, in Transvaal Museum; ♀ cotype in coll. Janse, from the same locality, in 22. 1. '04, both collected by H. H. Swinny.

DESMEOCRAERA TRIPUNCTA spec. nov.

(Pl. XIII, fig. 15.)

♂. Head, hairs on legs and under side of abdomen cartridge-buff (xxx); thorax and upper side of fore wing olive-buff (xl), on thorax mixed with black scales and hairs; fore wing thickly irrorated with black; palpi at sides, sides of head and prothorax on under side with mars-brown (xv) hairs; some hairs on fore tibia and on upper half of fore tarsi vinaceous-russet (xxviii); branches of antennae yellow ochre (xv); abdomen on upper side light drab (xlvi), first segments with some olive-buff and black hairs, terminal segments olive-buff with a few black hairs. Fore wing densely irrorated with black; a sub-basal black line till upper median, angled outwards below costa; antemedial line double, indistinct, curved outwardly at median fold and below vein 1*b*, inwards at upper median vein, sub-median fold and angled inwards at 1*b*; white scales between this line and medial line from costa to vein 1*b*; medial line

very indistinct, only indicated by some black scales at costa; two black diffused spots in cell, the first and biggest rounded and just above origin of vein 2, the other smaller and at lower angle of cell; a third rounded black spot below lower median and just before vein 2, all three surrounded by whitish scales; postmedial line black, double, indistinct and dentated at the veins, angled at veins 7 and 5, incurved between veins 6 and 3; some white lines between the two lines; sub-terminal faint, black irregular at the veins, very much angled inwards at veins 2 and 3; cilia mouse-grey, cartridge-buff at the veins. Hind wing white, with three broad diffused bars of black and olive-buff scales, from costa to vein 6; first bar at fork of 6, 7, third bar at apex and second in middle; some black terminal scales at apex; inner marginal area with long tilleul-buff (xl) hairs; outer margin with some mouse-grey edging; cilia white, except at apex.

Under side of both wings white; fore wing densely irrorated with light cinnamon-drab (xlvi) especially at costa; cilia light cinnamon-drab mixed with black; cilia of hind wing white.

Exp. 43 mm.

Hab. Malvern (Natal), 4. 7. '16 (bred by Mr E. E. Platt).

Only one ♂ is known to me, which Mr Platt kindly presented to my collection.

Larva feeds on *Eugenia cordata* Laws.; pupates in a brittle earthen cocoon (E. E. Platt).

DESMEOCRAERA PLATTI spec. nov.

(Pl. XIII, fig. 16.)

♂. Head, and thorax above greenish glaucous (xli) mixed with white and black hairs and scales; frons of head, palpi except at front, tibiae of fore legs on inner side, all tarsi on upper side, hairs of prothorax on under side chestnut-brown (xiv); palpi at front, narrow rings on tarsi, under side and inner side of tibiae and tarsi cream-buff (xxx); greenish glaucous hairs, mixed with black and chestnut-brown hairs on upper side of tibiae and femora; shaft of antennae black, branches antique-brown (iii); abdomen on upper side, Hay's brown (xxxix) except at the base where there is a tuft of long hairs like those of thorax and except the last segments which are covered with olivine (xxxii) scales; thorax and abdomen on under side cream colour (xvi).

Fore wing with ground colour deep chrysolite-green (xxxix) mixed with sea-foam yellow (xxxix) and black scales; a few black basal scales; sub-basal line black with rough sea-foam-yellow scales on outer side, angled outwards at vein 12, curved inwards to basal line at lower median, then forming a rounded black patch at between lower median and 1b, then indistinct; a tuft of light buff (xv) hairs at base on inner margin; a black streak on upper median from sub-basal to near antemedial line, and some black scales above it along costa; antemedial line black, narrow and preceded by rough white scales, excurved from costa to median fold, then erect to lower median, then interrupted by a rounded whitish patch between lower median and 1b, which has some greenish glaucous (xli) scales in its centre, then indistinct to inner margin; medial line preceded by whitish scales on costa, then faint at orbicular, then curved between lower median and sub-median fold, forming the outer edge of the light patch, then forming a curve outwardly till below vein 1b, then somewhat excurved to inner margin; orbicular and reniform broadly edged by whitish rough scales, the former round, the latter reniform; postmedial line double, faint, black, curved outwards at near costa, then oblique and well dentated on the veins; outer postmedial line followed by an often double line of whitish scales; costal half of wing between medial and postmedial lines densely covered with whitish

loose scales as far as vein 2; a broad black fascia below vein 2, from the whitish antemedial patch as far as white line between postmedial line and sub-terminal line; some black scales on costa beyond postmedial line; a white zigzag line from vein 8 to tornus between postmedial and sub-terminal lines, interrupted by a broad, black fascia between veins 3 and 4, which nearly reaches sub-terminal line; some black patches between the veins before this white line; sub-terminal line well defined, irregularly curved between the veins and from vein 8 to 1*b*, shaded on outer side with whitish, greenish-glaucous and black scales gradually forming a blackish shade into the cilia; cilia greenish-glaucous at the veins and brownish towards tip.

Hind wing densely irrorated with bister (xxix) especially at the veins and on termen, except the costal area, which is greenish-glaucous and has three indistinct black bars; cilia bister except at the veins and at the tips, where they are whitish.

Under side of fore wing cream colour at inner marginal area, but remainder warm sepia (xxix) and bister; cilia bister and distinctly dotted with cream colour at the tips; three cream coloured dashes at apex on costa; hind wing cream colour, some warm sepia scaling towards costa and on the veins; cilia warm sepia with cream coloured specks at the veins.

Exp. 41 mm.

Hab. Krantzklouf (Natal), 15. 6. '16. Bred by E. E. Platt. One ♂ type.

I have much pleasure in naming this beautiful species after its collector who kindly presented it to my collection.

Larva feeds on *Mimusops discolor* Sond., pupates in a brittle earthen cocoon (E. E. Platt).

DESMEOCRAERA STENIPTERA.

(Pl. IV, figs. 12, 13.)

Stauropus steniptera Hmps. *A.M.N.H.* 8. v. p. 471 (1910).

I have in my collection specimens collected in S. Rhodesia at Umvuma 12. '17, Emangeni 18. 1. '18; Salisbury 27. 10. '17 (R. Jack); all these are ♂s, and in the Transvaal Museum are two specimens, ♂ and ♀ from Pretoria in Jan. 1898.

This and the following species are peculiar for their very short pectination of the antennae; in the ♀ they are even simple and fasciculated; the palpi are also much shorter, more porrect and covered with hairs only, the second joint is as long as the first joint and the third joint is half as long; the process of the fore leg is much more pointed and somewhat curved; in the fore wing vein 10 originates from or from before vein 7.

In this species the sub-basal lines and especially the postmedial lines are very indistinct and diffused in the specimens I have seen; they also range from 38 to 44 mm.

DESMEOCRAERA PERGRISEA.

Stauropus pergrisea Hmps. *A.M.N.H.* 8. v. p. 472 (1910).

I have one worn ♂ in my collection from Durban, collected in Nov.

Species auctorum: The following species have been placed by Sir George Hampson in the genus *Stauropus*, but I have little doubt, that they all have to be placed in *Desmeocraera*; *D. hierax* has been placed by me in *Paravethona*.

Stauropus atribasalis Hmps. *A.M.N.H.* 8. v. p. 467 (1910).

Stauropus octoginta Hmps. *l.c.* p. 468 (1910).

Stauropus agramma Hmps. *l.c.* p. 471 (1910).

Stauropus griseiviridis Hmps. *l.c.* p. 469 (1910).

Genus PHYLLALIODES.

(Pl. I, figs. 22-24; Pl. IV, figs. 18, 19.)

Phyllaliodes Hmps. *A.M.N.H.* 8. v. p. 474 (1910).Type *agramma*.

♂. Proboscis very minute; palpi porrect, just beyond frons, three jointed; first joint and second joint of equal length; third joint about half of second joint; first and second joint with very long hair on under side; third joint hidden in hairs; eyes large, oval, naked; antennae about half of costa, bipectinated till tip, longest branches about 5 times shaft; a tuft of hair on first joint; frons, head above and thorax with long smooth hairs; abdomen without crests; fore tibia with a process shorter than tibia; curved very much outwardly and entirely hidden in very long hairs; mid tibia with two spurs, hind tibia with four; spurs moderate in length, ending in a smooth, slightly curved point, spurs covered with scale-like hairs; inner spurs about $\frac{2}{3}$ rd of outer spurs; femurs with very long hairs; mid*and hind tibiae with moderate hairs on inner side; tarsal joints with spines on inner side and further covered with short scales and hairs. Fore wing triangular; costa straight; apex rounded; outer margin nearly straight, somewhat oblique; termen rounded; inner margin nearly straight; 1 *b* nearly straight (I cannot see if it is forked without removing the scales, which are very dense at base); 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are straight; 6 and 7 on a short stalk and from upper angle; 8, 9, 10 stalked and from just beyond upper angle; 8 from just beyond $\frac{2}{3}$ rd of 9; 10 from just before $\frac{1}{3}$ rd of 9; 11 from upper median at $\frac{4}{5}$ th; 12 parallel to costa.

Hind wing semi-circular; costa straight; apex rounded; outer margin very oblique, well rounded and with a rounded lobe at 2 and 3; tornus well rounded; inner margin curved; 2 from before $\frac{2}{3}$ rd lower median; 3 and 4 on a short stalk and from lower angle; 5 from half of discocellulars, which are straight and erect; 6 and 7 from upper angle, stalked for about $\frac{1}{3}$ rd of 6; 8 nearly straight and connected with upper median at $\frac{1}{3}$ rd with a slight bar.

The following details were kindly given to me by Sir George F. Hampson, supplementing the information published by him in the original description and which leave no doubt as to my identification being correct: ♂. Palpi porrect, to rather beyond frons and clothed with long hair; eyes smooth; antennae with long branches, about five times shaft, and to apex; hind tibia with two pairs of spurs; thorax and abdomen without crests; fore wing rather narrow; the apex rounded; 3 from before angle; 5 from middle of discocellulars; 6 very shortly stalked with 7; 8, 9, 10 stalked; no pecten on inner margin; hind wing 3, 4 stalked; 5 from middle of discocellulars; 6, 7, stalked.

PHYLLALIODES AGRAMMA.

Phyllaliodes agramma Hmps. *A.M.N.H.* 8. v. p. 474 (1910).

This is the only species known up to now. I have one specimen from Port Shepstone, the same locality from which the type specimen comes.

Genus HYPOPHIALA nov.

(Pl. I, figs. 26, 27; Pl. IV, figs. 20-24.)

Type *melanogramma* spec. nov.

♀. Head small, retracted; eyes large, round, naked; proboscis very rudimentary; palpi porrect, short, fringed with very long hairs; first joint nearly

straight, shorter than second joint, which is slightly curved and about two times third joint in length; third joint short, somewhat oval, covered with some scales, mixed with hairs here and there; antennae about half of costa, bipectinate till tip; branches about three times shaft and with fine cilia in front; thorax with long hairs; abdomen with short hairs and without crests; femora below and tibiae outwardly fringed with long hairs; tarsal joints with short stiff hairs, mixed with spines on inner side; process of fore tibia nearly as long as process, somewhat twisted, directed outwardly and with a hollow in the tibia below it; mid tibia with two, hind tibia with four spurs, of which the inner spurs are longer than the outer, all rather sharply pointed and covered with hairs.

Fore wing sub-triangular; costa curved towards apex, which is rounded; outer margin somewhat oblique, curved between veins 2 to 7, very slightly sinuated; tornus rounded; inner margin straight; *1b* somewhat curved, probably not forked at base; 2 from before $\frac{2}{3}$ rd lower median; 3 from beyond half 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are somewhat oblique inwardly and curved; 6 from near upper angle; stalk of 7, 8, 9 from upper angle; 7 from stalk at before half of 8; 9 from 8 at about $\frac{2}{3}$ rd; 10 from upper median beyond half origin 11 and upper angle; 11 from upper median at $\frac{1}{4}$ th; 12 parallel to costa. Hind wing broad, triangular; costa somewhat incurved; apex well rounded; outer margin oblique, somewhat hollowed out at 3 to 6; tornus very much rounded; inner margin well rounded at 1a; 1a and 1b somewhat curved; a trace of 1c; 2 from lower median at beyond half; 3 from near and 4 from lower angle; 5 from middle of discocellulars which are outwardly oblique and nearly straight; 6 and 7 on a stalk of about $\frac{1}{3}$ rd of 7; 8 upcurved at base, then downcurved to upper median and approximating but not touching it, then straight to apex.

HYPOPHIALA MELANOGRAMMA spec. nov.

(Pl. XIV, fig. 3.)

♀. Fore wing and hind wing pure white; fore wing with the costa edged with pale orange-yellow (iii); very fine black lines on part of vein 12, on upper median, discocellulars, lower median, vein 1b, veins 2 to 9, and a fine black line in middle of cell from base to discocellulars and another from near base to outer margin on plical fold; cilia white; hind wing with all veins covered with fuscous (xlv) scales; the whole wing, except near base and costa and at terminal area irrorated with fuscous; cilia white; under side of both wings white; costa of fore wing pale orange-yellow; greater part of fore wing thickly irrorated with fuscous, except near base, along inner margin, tornus, termen and apical part of costa; all veins covered with fuscous; cilia white. Hind wing remains pure white except for the fuscous lines on veins and plical fold; hairs on head and thorax long, shaggy, and tinged with lichen-green (xxxiii); on under side white hairs; hairs of palpi and tuft of antennae pale orange-yellow; long hairs on femurs and tibiae white, slightly tinged with lichen-green; short hairs on tibiae and tarsi pale orange-yellow; tarsal joints broadly ringed with black; antennae light orange-yellow, some segments edged with xanthine-orange (iii) to argus-brown (iii); abdomen on under side white, tinged with lichen-green.

Exp. 48 mm.

Hab. Salisbury, 4. 12. '15. One specimen (the type) in coll. Janse, kindly presented by Father O'Neil, who has another specimen in his collection.

This species looks at first sight very much like a Striphnopterygid, from which it differs however entirely in structure. This genus comes evidently close to Phyllaliodes and may be a development of it.

Genus STAUROPUS.

(Pl. V, fig. 4; Pl. VI, figs. 1-7.)

Stauropus Germar. *Prod.* p. 4 (1811).Hmps. *Moths of India*, I. p. 149.Meyr. *Brit. Lep.* p. 307.Spuler. *Schmett. Eur.* I. p. 93.*Netria* Wlk. *Cat.* VI. p. 1504 (1855).Type *S. fagi*. Description made from *S. mediata*.

♂, ♀. Proboscis absent; palpi short, porrect, projecting beyond frons; first joint short and with a long tuft of hairs and hair-like scales; second joint about half as long, sub-cylindrical; third joint about half of second joint and both covered with hairs and hair-like scales; eyes large, rounded, glabrous; antennae almost half of costa, bipectinated for a little over $\frac{2}{3}$ rd of shaft and at the tip the pectinations get suddenly shorter, in ♂ about 12 times shaft, in ♀ about 8 times shaft; first joint of shaft sub-globular and with a tuft of hairs in front; fore tibia of ♂ with a broad bluntly rounded process, not quite as long as tibia; mid and hind legs with terminal spurs only, pointed into a curved hook and covered with hairs; about half way of the curve of this hook are on each side little rounded lobes; inner spur longer than outer; tibiae of fore and hind legs densely covered with hairs and some scales; femurs of all legs and tibiae of hind legs rather thinly clothed with hairs; tarsal joints of all legs tufted with hairs. Fore wing rather broad, sub-triangular; costa nearly straight; apex well rounded; termen oblique, rounded; tornus rounded; inner margin somewhat excurved at middle; *1b* indistinctly forked at base; *1c* faintly indicated, especially towards termen; 2 from $\frac{3}{4}$ th lower median, curved; 3 from well below lower angle; 4 from lower angle; 5 from just above middle of discocellulars, which are erect; lower discocellular sending a small veinlet into the cell; 6, 7, 8, 9, 10 stalked; 6 from stalk at about $\frac{1}{4}$ th of 8; 7 from stalk at middle of 8; 9 from just beyond $\frac{3}{4}$ th of 8; 10 from beyond middle of origin of 6 and 7; 11 from upper median at $\frac{4}{5}$ th 12 parallel to costa. Hind wing triangular, broad; costa nearly straight; apex well rounded; termen well rounded, oblique; tornus well rounded; inner margin straight; *1a* nearly straight; *1b* forked at base, curved; a trace of *1c*; 2 from $\frac{2}{3}$ rd of lower median; 3 from well before lower angle; 4 from lower angle; 5 rather weak, from middle of discocellulars, which are almost erect and have each a faint veinlet in the cell; 6 and 7 on a stalk of half 6; 8 running close to upper median till beyond middle of cell, but not anastomosing with it, at base even slightly remote, then curved upwards to costa.

A large number of species were placed by various authors in this genus, but all these I had to remove to the genus *Desmeocraera*, owing to these species having four spurs on the hind legs and not two, and also on account of several other characters.

As I have not been able to study the type of this genus, I am not quite certain that *mediata* should be placed here, especially as the different authors do not quite agree in every respect as regards the characters of this genus. However, *mediata* cannot be placed in any other genus known to me and as these points of difference do not, on the whole, throw this species out, I think it safe to leave it here.

STAUROPOUS MEDIATA.

(Pl. V, fig. 4; Pl. VI, figs. 1-7.)

Ochrostigma mediata Wlk. *Cat.* xxxii. p. 412 (1865).Kirby. *Cat.* i. p. 603.

This species does certainly not come in *Ochrostigma* as the ♂ has the antennae not pectinated till the tip and they are pectinated in the ♀ also and not serrate, while the hind tibiae have only two spurs and not four; the fore wing has also no areole as given for *Ochrostigma*.

I have this species from Durban only and never met with it in any other locality. In Jan., Febr., March, Oct., Nov.

Larva feeds on *Ekebergia meyeri* Presl., and *Combretum gulinzii* Sond. (E. E. Platt).

Genus PHALERA.

(Pl. V, figs. 5, 6; Pl. VI, figs. 8-14.)

Phalera Hübn. *Verz. bek. Schmett.* p. 147 (1822).Dist. *Ins. Transv.* iv. p. 89.Hmps. *Moths of India*, i. p. 133.Spuler. *Schmett. Eur.* i. p. 101.Type *bucephala*. Description from *imitata*.

♂, ♀. Proboscis short and weak; palpi short, just reaching frons, obliquely upturned; first joint short, about $\frac{1}{3}$ rd of palpus, slightly curved; second joint longer than first, slightly curved; third joint short, about half of second joint, narrow; all joints covered with long hairs, scale-like hairs and scales in front and with some hairs above; eyes large, round and naked; antennae short, less than half of costa, bipectinate in ♂ till a little beyond middle (in *lydenburgi* and other species fasciculated or simple), in ♀ also bipectinate as in ♂, but pectinations carried further towards tip (in some species simple) (in the type of the genus which looks very much like *imitata* the joints of the antennae are globular and have on each joint a hair-brush at each side); first joint globular and with a hair-tuft in front; branches two times shaft and densely ciliated; fore tibia covered with dense hairs, especially on inner side; process rather broad and short, just reaching end of tibia, on upper side somewhat open where it is attached to the tibia, then flattened and twisted, ending in a blunt rounded point; mid tibia with two spurs; hind tibia with four spurs; spurs stout ending in a curved point, which has two rows of teeth, less conspicuous than in *Rigema*, and densely covered with hairs; femurs of all legs with long hairs on the outer side; tibiae, especially the hind tibia, with long hairs on the outer side; tarsi with spines on inner side and well covered with appressed hairs. Fore wing sub-triangular, rather broad; costa straight (well curved in ♀), curved towards apex; apex rounded; termen somewhat oblique, straight, slightly sinuate; tornus rounded; inner margin slightly curved; *1b* indistinctly forked at base; 2 from lower median at beyond $\frac{2}{3}$ rd; 3 from $\frac{3}{4}$ th 2-4; 4 from lower angle; 5 rather weak, from above middle of discocellulars, which are erect and nearly straight; a faint forked veinlet in cell; 6 from beyond middle of areole, which is narrow and long; 7, 8, 9, 10 stalked and from end of areole; 7 from a little beyond end of areole; 9 from 8 at $\frac{2}{3}$ rd the distance from end of areole to apex; 10 from stalk at $\frac{1}{4}$ th that distance; 11 from upper median at beyond $\frac{2}{3}$ rd; 12 parallel to costa. (In *lydenburgi* the venation of 6, 7 is somewhat different, in fact I expect some variations within the species as

found in *Antheua*, etc.; in *lydenburgi* 6 comes from near upper angle, 7 from end of areole, which is much shorter and broader than in *imitata*.) Hind wing broadly triangular; costa somewhat curved; apex well rounded; termen very oblique and well rounded; tornus rounded; inner margin straight; 3 from near lower angle; 4 from lower angle; 5 rather weak and from above middle of discocellulars, which are oblique at lower and more erect at upper discocellular; 6, 7 stalked for nearly $\frac{2}{3}$ rd of 6; 8 parallel and close to upper median, then oblique to costa; an indication of a bar at $\frac{1}{3}$ rd of upper median. Hairs on thorax rather short, forming irregular crests; a crest of spreading hairs on first abdominal segments.

There is close affinity between this genus and *Zana*, *Antheua* and *Rigema*, in fact very few distinct characters can be found. The irregular hairs on the thorax and the transverse lines of the fore wing are perhaps the most easily observed ones, while the shape of the fore wing of *Rigema* will make it easy to separate *Phalera* from this genus.

Phalera is distributed throughout Europe, Asia and Africa; three species have been found so far in South Africa.

Key to South African species:

- 1 a. Fore wing with a large rounded yellow patch at apex, filling terminal area from vein 5 to costa; antennae in both sexes bipectinate **imitata**
- b. Fore wing not with such apical patch; antennae simple **2**
- 2 a. Head red; thorax fuscous; abdomen red, except at terminus; wings on under side white; antennae ciliated **lignitea**
- b. Head brown; abdomen orange-yellow striped with black towards terminal half; antennae fasciculated in ♂; fore wing on under side fuscous, hind wing light yellow **lydenburgi**

PHALERA IMITATA.

(Pl. V, fig. 5; Pl. VI, figs. 8-14.)

Phalera imitata Druce. *A.M.N.H.* 6. xvii. p. 356 (1896).

I have a specimen in my collection from Durban which has been identified by Prof. Aurivillius as *Phalera imitata* and though it differs in many respects from the description, which was probably drawn up from one ♂ only and moreover came from Dar-es-Salaam, I think that the identification is correct. Its resemblance to *bucephala* makes it at once characteristic among the South African moths, but as there are several points of difference and as the ♀ is still undescribed, I give a more detailed description in supplement to the one given by Druce.

Sub-basal, antemedial and postmedial lines black and irregular; indications of a dark orbicular; reniform of ground colour, surrounded by white, often indistinct; three double wavy bands between antemedial and postmedial lines, diffused, somewhat darker than ground colour and each part filled in with whitish; postmedial line evenly curved from below costa to vein 4, followed by a brown line which borders the yellow apical patch; three black streaks along costa towards apex, separated from each other by yellow on the veins; an irregular sub-terminal brown line (preceded by light yellow) in yellow apical patch from apex obliquely inwards to vein 4 and then continued by a few yellow diffused spots and dentated outwardly on the veins; cilia brown. Hind wing of ♂ white, with orange hairs on inner marginal area; cilia slightly checkered with brown; in ♀ the hind wing is wholly suffused with fuscous except inner marginal area, which is more narrowly covered with yellow hairs

than in the ♂; cilia distinctly checkered with brown at the veins. Under side of ♂ whitish with the veins here and there scaled with black; fore wing densely suffused with fuscous except terminal area, especially at apex; three black costal streaks near apex, more distinct than on upper side in both sexes; hind wing thinly suffused with fuscous at the medial area; veins of both wings quite black at terminal half; palpi fuscous-brown at sides, scarlet in front; frons and some hairs of prothorax scarlet; some black narrow rings in some ♂ specimens on abdomen; ♀ with a broad black transverse band before terminal segment. My specimens are from Emangeni, Umtali, and Sawmills (S. Rhodesia); New Hanover, Karkloof, Sarnia, Durban and Umkomaas (Natal); in Jan., Nov., Dec.

PHALERA LYDENBURGI.

(Pl. V, fig. 6.)

Phalera lydenburgi Dist. *A.M.N.H.* 7. III. p. 463 (1899).

Dist. *Ins. Transv.* IV. p. 89, Pl. IV, fig. 12. ♀.

I have this species in both sexes from S. Rhodesia (Sawmills, Umvuma, Emangeni, Salisbury, Umtali) in Nov., Dec., Jan.

PHALERA LIGNITEA.

Phalera lignitea Mab. *Ann. Soc. ent. France*, LXVIII. p. 723 (1900).

This species is unknown to me and is given as from South Africa, without further indication of locality.

Genus RIGEMA.

(Pl. V, fig. 7; Pl. VI, figs. 15-21.)

Rigema Wlk. *Cat.* v. p. 1079 (1855).

Dist. *Ins. Transv.* IV. p. 91.

Type *vittata* Wlk. Description from *ornata*.

♂ and ♀. Proboscis short; palpi porrect, short, **hardly** reaching frons; first joint slightly longer than second joint; third joint about half of second; all joints with long, spreading hairs in front and shorter hairs above; frons with rather long spreading hairs; eyes large, naked, rounded; antennae of ♂ very shortly bipectinate for over half their length; branches very short, a little longer than width of shaft and terminally tufted with cilia; terminal half of shaft lamellate; first joint of shaft large, globular and tufted with long hairs in front; antennae of ♀ simple, ciliated; fore tibia with a process reaching till end of tibia, fitting in a hollow of tibia on upper part and flattened out from before terminal half; process and tibia with dense hairs; mid-tibia with two spurs, hind tibia with four; spurs moderate, ending in a curved point on which there are on inner side two rows of flat teeth, spurs covered with rather long hairs; femora of all legs moderately covered with long hairs on outer side; tarsi with thorns on inner side and covered with appressed hairs. Fore wing rather elongate; costa nearly straight, well rounded towards apex, so as to make the apex somewhat produced; apex acutely rounded; termen slightly sinuate and oblique, lobed at between 3 and 5; tornus well rounded; inner margin nearly straight; 1*b* faintly forked at base; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are somewhat oblique outwardly and straight, with indications of forked veinlet

in cell; 6 from areole, a little above the upper angle; 7 from areole just before its end; areole long, reaching till about $\frac{1}{3}$ rd upper angle to apex; 8 and 9 stalked for half the length of 9 beyond the end of the areole, stalk originating from end of areole; 10 almost from end of areole, but from beyond 7; 11 from beyond $\frac{2}{3}$ rd upper median; 12 parallel to costa; hind wing semicircular; costa arched at $\frac{1}{3}$ rd; apex produced from 8 to 7, then acutely rounded; termen very oblique, slightly lobed at 4; tornus well rounded; inner margin rounded and oblique; 1a straight; 1b curved; 2 from lower median at before $\frac{2}{3}$ rd; 3 from near lower angle; 4 from lower angle; 5 from above middle of discocellulars of which the lower is oblique and the upper nearly erect; 6 and 7 on a stalk of over $\frac{1}{3}$ rd and from upper angle; 8 parallel to upper median to near upper angle, then oblique to costa before apex; a faint bar at $\frac{1}{3}$ rd of upper median. Abdomen of ♂ with a forked tuft of hairs and lateral black spots as in *Antheua* and *Phalera*; hairs of thorax short, smooth or only very slightly crested. The venation appears to differ in some specimens as much as in *Antheua*, some specimens of *ornata* have vein 7, stalk of 8, 9 and 10 from end of areole; the length of stalk 6-7 of hind wing also varies somewhat; in *woerdeni* the areole is shorter (about $\frac{1}{10}$ th of wing length), 6 is from areole at just before middle; 7 from stalk of 8, 9 at $\frac{1}{7}$ th of stalk; 9 from 8 at $\frac{2}{3}$ rd distance of end areole to apex; 10 from stalk of 8, 9 at beyond $\frac{1}{3}$ rd of stalk and far beyond origin of 7.

Three species were placed in this genus by other writers, but I removed *aurifodinae* from here to *Antheua*.

The remaining two species may be separated as follows:

- 1 a. Abdomen orange-yellow above; thorax almost entirely yellow; fore wing with stigma at the end of cell and with a terminal dark shading **woerdeni**
 b. Abdomen black to near tip above; thorax yellow, much suffused with brown; fore wing without a stigma and with a broad terminal dark line which is much crenulated **ornata**

RIGEMA ORNATA.

(Pl. V, fig. 7; Pl. VI, figs. 15-21.)

Rigema ornata Wlk. *Cat.* xxxii. p. 437 (1865).

Dist. *A.M.N.H.* 6. xx. p. 204 (1897).

Dist. *Ins. Transv.* iv. p. 91, Pl. VIII, fig. 9.

Miss Barrett. *Ent. Month. Mag.* p. 124 (1902).

I have both sexes of this species from Transvaal (Pretoria, Waterval onder, Kaapmuiden, Noordkaap, Barberton); Natal (Karkloof, New Hanover, Pinetown, Durban, Umkomaas); S. Rhodesia (Emangeni); in Jan., Febr., March, May, Nov.

Larva feeds on grass (E. E. Platt).

RIGEMA WOERDENI.

Phalera woerdeni Snell. *Tijdschr. voor Ent.* xv. p. 45 (1872).

Rigema woerdeni Dist. *A.M.N.H.* 6. xx. p. 204 (1897).

Dist. *Ins. Transv.* iv. p. 91, Pl. VIII, fig. 8.

Only one ♀ in my collection from the Transvaal, but I do not know from what part.

Larva feeds on grass (E. E. Platt.)

Genus **LEUCOPHALERA** nov.

(Pl. V, fig. 8; Pl. VI, figs. 22-25.)

Type *elegans* spec. nov.

♂. Proboscis rudimentary; palpi porrect, just reaching frons; first and second joints of equal length; third joint about half of second; all joints covered with long spreading hairs, mixed with hair-like scales; head small; frons smooth, covered with moderate hairs; eyes smooth, large, rounded; thorax stout, covered with hairs; tegulae covered with scales; abdomen without crests and covered with hairs; antennae less than half of costa, bipectinate till tip; pecten about five times shaft and with cilia on both sides; first joint of shaft with a tuft of hairs on inner side; femora with long dense hairs on inner side; fore tibia with long dense hairs on inner side and with an almost straight process reaching a little beyond the tibia; mid and hind tibiae with long dense hairs on outer side; mid tibia with two spurs, hind tibia with four; spurs of nearly equal length, shorter than first tarsal joint, rather thick, covered with dense hairs and ending in a short, slightly curved point, which has two rows of teeth; tarsi covered with dense hairs. Fore wing elongate triangular; costa slightly curved inwards at middle and gently rounded towards apex; apex rounded; termen somewhat oblique, only very slightly sinuate; tornus rounded; inner margin straight; *1b* straight; 2 from $\frac{2}{3}$ rd of lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are erect, nearly straight; 6 from upper angle; 7 and stalk of 8, 9, 10 from end of areole; areole rather short, triangular; 9 from 8 at $\frac{2}{3}$ rd the distance of end of areole to apex; 10 from $\frac{1}{3}$ rd that distance; 11 from $\frac{1}{3}$ rd upper median; 12 parallel to upper median and vein 11. Hind wing semicircular; costa somewhat curved near base, then straight; apex rounded; termen very oblique, somewhat hollowed out at vein 5 and very much rounded beyond vein 3 forming an even curve with tornus, which is much rounded; inner margin straight beyond *1a*; *1a* and *1b* straight; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, of which the lower is somewhat oblique and the upper erect; 6 and 7 from upper angle, very shortly stalked; 8 parallel and closely approximated to upper median till near upper angle, then straight to apex.

This genus comes close to *Phalera*, from which it differs mainly in process of fore tibia, position and covering of palpi, shape of fore wing and hind wing, much shorter stalk of 6, 7 of hind wing and in the general pattern of the fore wing.

LEUCOPHALERA ELEGANS spec. nov.

(Pl. XIV, fig. 4; Pl. V, fig. 8; Pl. VI, figs. 22-25.)

♂. Posterior $\frac{2}{3}$ rd of thorax, tegulae and ground colour of fore wing pure white; most hairs of palpi, frons, tufts on antennae, remainder of thorax and ground colour of hind wing and of both wings on the under side buff-yellow (iv); shaft and branches of antennae black; hairs of femora and tibiae and under side of thorax fuscous and fuscous-black (xvi); tarsi black, ringed with white; abdomen on upper side and sides ochraceous-orange (xv) (my specimen is somewhat greasy so the colour is probably lighter), a lateral series of black spots; one on each segment. Fore wing: some black basal scales from costa to vein 12, indicating basal line; antemedial line double, broad, with a faint white line between them, somewhat curved outwardly, inner line brazil-red (i), continuous, very slightly dentate inwardly on lower median, plical fold, and *1b*, outer line

black, much indented on inner side at upper and lower median, plical fold and 1*b*; some black oblique scaling along costa before and beyond it; median line faint, smoke-grey (xlvi), narrow, somewhat incurved below lower median and dented outwardly on the veins; postmedial line, like antemedial line, double, with a thin white line between them, but inner line black, outer line brazil-red, becoming orange-fuscous (ii) below vein 3; inner black line faint, mixed with orange-rufous scales between veins 2 and 3, almost straight till vein 4, then somewhat curved to tornus; both lines indented outwardly on most of the veins, especially the black line; immediately beyond the brazil-red band, but separated from it by a somewhat broad white line, another band, somewhat diffused on the edges, rather broad near costa and tapering towards vein 3, then curved inwardly and faint between vein 2 and plical fold; this band is brazil-red with here and there some white scales between the costa and vein 7, then brazil-red and more or less irrorated with black scales, most densely between 3 and 7; a sub-terminal series of black lunate spots between the veins, from vein 2 to 7; cilia ivory-yellow except at tornus, where they are mixed with black and brazil-red hairs and scales; hind wing: all veins and plical fold irrorated with fuscous black along postmedial area joining a terminal irrorate line; cilia coloured like hind wing. Under side: two or three fuscous oblique costal strigae on veins 10-12 near apex; all veins of both wings more or less strongly irrorated with fuscous and fuscous-black from medial line to termen; plical fold also irrorated for a short distance; fore wing with a sub-terminal fuscous-black shading from tornus to vein 7, towards which it becomes narrower, undulating inwardly between the veins; a more pronounced fuscous-black terminal line, somewhat broken up by ground colour between most of the veins, well situated inwardly between the veins and extending from 1*a* to 8; cilia of ground colour, tipped with ivory-yellow; hind wing with a very thin fuscous-black terminal line; cilia as in fore wing.

Exp. 60 mm.

Hab. S. RHODESIA (Umtali), 1917. One ♂ only, but two other ♂s are in Father O'Neil's collection.

This beautiful species has been presented to me by Father O'Neil, but I understand that he has not caught it himself. Though slightly greasy, it is in fairly good condition.

Genus CHADISRA.

(Pl. V, fig. 9; Pl. VI, figs. 26-28; Pl. VII, figs. 1-6.)

Chadisra Wlk. *Trans. Ent. Soc. Lond.* ser. 3, 1. p. 81 (1862).

Hmps. *Moths of India*, 1. p. 159.

Schaus. *Trans. Ent. Soc. Lond.* p. 311 (1901).

Type *bipars* Wlk. Description made of *curvilinea*.

♂, ♀. Proboscis rather stout; palpi upturned, almost reaching vertex of head, covered with scales and hairs; first joint well curved and about $\frac{1}{3}$ rd of palpus in length; second joint almost two times first joint, cylindrical; third joint very small, about $\frac{1}{3}$ rd of first joint; eyes naked, large, rounded; antennae about half of costa, in ♂ dentate and fasciculate in some species (*curvilinea*), bipectinate till tip in others; in ♀ ciliate or shortly bipectinate; first joint with a large anterior and posterior tuft of scales and hairs; femora and tibiae covered with hairs and scale-like hairs; tarsi with spines on inner side and covered with scales; fore tibia with a keel shaped process, which is rather short and blunt in the ♂, longer and ending in a curved point in the ♀; on the edges of this process are rows of stiff hairs and the process itself is partly hidden in

the tibia; mid tibia with two terminal spurs, covered with scales and ending in a curved point which has teeth on the inner side; outer spur about $\frac{1}{4}$ th shorter than inner spur; hind tibia with four spurs, in structure and proportion like spurs of mid tibia; a tuft of scales on mid and hind tibiae at $\frac{3}{8}$ rd of their length.

Fore wing rather narrow; costa gently curved till vein 12, where it has a bulge outwardly, then almost straight to apex, which is rounded; termen very oblique, well curved between veins 2 and 7 and somewhat sinuate up till 11; tornus very acute; inner margin incurved beyond tornus, then outcurved at $\frac{1}{3}$ rd; 1b well curved (like inner margin), indistinctly forked; lower median upcurved; 2 from $\frac{3}{8}$ rd lower median; 3 from $\frac{4}{5}$ th 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are erect; 10 from upper median from before upper angle at about half the distance of vein 5 to upper angle, then anastomosing with 6, 7, 8, 9 to form an areole as long as nearly half of 10; 6 from areole at $\frac{3}{8}$ rd; 7 stalked with stalk of 8, 9 for half length of 7; 9 from 8 at $\frac{3}{4}$ th of 8; 10 from stalk of 7, 8, 9 well beyond the areole; 11 from upper median at $\frac{3}{8}$ rd; 12 parallel to costa, ending at $\frac{3}{8}$ rd of costa. Hind wing subtriangular; costa slightly arched; apex obliquely rounded; outer margin well curved, sinuate; tornus rounded; inner margin incurved; 1a and 1b somewhat incurved; 2 from before $\frac{3}{8}$ rd lower median; 3 from $\frac{4}{5}$ th of 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are erect and have indications of a forked vein in the cell; 6 and 7 stalked for $\frac{1}{3}$ rd of 6; 8 upcurved at base, downcurved at $\frac{1}{3}$ rd then obliquely upcurved to near apex; upper median well curved and connected to 8 by a bar at before half its length. The hind wing of all species coming in this genus have all, as far as I know, a dark mark at the tornus, intersected by one or more light striae. Of the other South African Notodontids only *bicolor* has an indication of such a spot, but that it does not come in this genus at all is clearly shown by its structure, as it has vein 7 of fore wing from *before* the free part of vein 10 and not as in *Chadisra*; moreover the broader fore wing, the heavier build and the very long pectination of the ♂ antennae place it at once in *Antheua*. I therefore take it out of *Chadisra*, leaving only 4 species, which may be distinguished as follows:

- | | | |
|------|--|-------------------|
| 1 a. | Antennae of ♂ bipectinate, with long branches | 2 |
| b. | Antennae of ♂ minutely serrate and fasciculate | 4 |
| 2 a. | Apex of antennae ciliated | 3 |
| b. | Apex with short branches, colour of fore wing uniform | rosinaria |
| 3 a. | Colour of basal part of fore wing yellow, terminal half rufous mixed with grey | semiflava |
| b. | Whole fore wing uniformly ochreous, suffused with red-brown and slightly irrorated with black | uncifera |
| 4 a. | Basal half of fore wing pale yellow, irrorated and in parts clouded with brown | persimilis |
| b. | Basal half of fore wing pinkish ochreous-grey, in some specimens lighter, in others darker than the terminal half, but never pale yellow | curvilinea |

CHADISRA CURVILINEA.

(Pl. V, fig. 9; Pl. VI, figs. 27, 28; Pl. VII, figs. 1-6.)

Hyperaeschra curvilinea Swinh. *A.M.N.H.* 7. XIX. p. 207 (1907).

This species evidently does not come in *Hyperaeschra*, a genus so far not recorded from S. Africa for other species, as the inner margin of the fore wing has no tuft of scales, the palpi have scales as well as hairs, and 6 of fore wing

comes from the areole. No doubt the pattern of the fore wing has misled Swinhoe, as it is very much as in the species of *Hyperaeschra*.

My ♀s agree well with the original description, which, however, is very short and makes no mention of greenish shading in the fore wing and on the thorax as shown in some of my specimens. My two ♂s are much darker and less distinctly marked, but this species is very variable as regards colouration and I have seen a ♀, which is in Mr Platt's collection, and caught in Durban 15. 11. '17 by Mr Bell-Marley, in which the green is much brighter and more distinct, while the brown of the medial part is much darker and there is a terminal black irroration. Its tegulae and the basal half of the fore wing are purplish brown, and the length of the fore wing is 25 mm. I have seen another specimen which was of a more uniform brown with no trace of green at all. My specimens are all from Durban, in March, May, June.

Larva feeds on *Chaetachme aristata* Planch, and *Trema bracteolata* Blume (E. E. Platt).

CHADISRA SEMIFLAVA.

Chadisra semiflava Hmps. *A.M.N.H.* 8. v. p. 462 (1910).

One ♂ specimen in my collection from Durban and I have seen another somewhat darker specimen which is in E. L. Clark's collection.

CHADISRA PERSIMILIS.

Chadisra persimilis Hmps. *A.M.N.H.* 8. v. p. 463 (1910).

I have seen a specimen in Platt's collection, which I take to belong here. As, however, the ♀ of *persimilis* as well as *semiflava*, which two species are very similar in wing pattern, have not been described, I think that only further breeding of specimens can decide on this point.

CHADISRA UNCIFERA.

Chadisra uncifera Hmps. *A.M.N.H.* 8. v. p. 459 (1910).

I have a ♂ in my collection, which I think comes here, but which is in too poor condition to be quite certain. However, it is co-specific with a ♀, which is in fine condition and sharply marked, bred by Mr Platt at Durban 4. 9. '18, and which I certainly think has to be placed here. That specimen agrees in practically every detail with the description and has the antennae pectinated as in the ♂ except that the branches are somewhat shorter.

Mr Platt informs me that the larva of this species fed on *Dombeya cymosa* Harv.; it made a subterranean cocoon on May 5th, but did not pupate until August. Moth emerged Sept. 4th.

CHADISRA ROSINARIA.

(Pl. VI, fig. 26.)

Chadisra rosinaria Hmps. *A.M.N.H.* 8. v. p. 461 (1910).

Three specimens of this species are in my collection, two ♂s and one ♀, all from Natal (♀ from Inchangá). In my specimens not only the fore tibiae have a black ring, but this ring is present on all the tibiae; in my ♀ there is also a black narrow discoidal striga, more faintly marked in the ♂s and not mentioned in the original description. My ♀ is 52 mm.

Genus HOPLITIS.

(Pl. VII, figs. 7-12.)

Hoplitis Hübn. *Verz. bek. Schmett.* p. 147 (1816).Wlk. *Cat.* v. p. 990.Spuler. *Schmett. Eur.* 1. p. 93.*Hybocampa* Led. *Verh. Zool.-Bot. Verein zu Wien*, II.*Atrasana* Wlk. *Cat.* VII. p. 1749 (1856).Type *milhauseri*. Description from *dasychiroides*.

♂, ♀. Proboscis very rudimentary; palpi short, just till frons, porrect, covered with dense hairs; first joint curved; second joint straight, nearly of same length as first joint; third joint minute, sub-globular; eyes naked, large, globular; frons with a tuft of hair; antennae about half length of costa, bipectinate for $\frac{2}{3}$ th their length; first joint of shaft globular and with a tuft of hair in front; branches of ♂ about eight times shaft, of ♀ about three times shaft; branches densely ciliated on outer side; fore tibia with a straight process rounded at tip and a little longer than the tibia; mid tibia with two moderate spurs; hind tibia with four spurs; spurs acuminate, point with two short ridges of teeth; all legs densely covered with rather long hairs; tarsi covered with hairs, scales and spines.

Fore wing rather narrow; costa slightly concave, well rounded towards apex; outer margin very oblique, rounded; inner margin nearly straight; apex rounded; tornus well rounded; 1*b* with a rather long fork; 2 from beyond $\frac{2}{3}$ rd lower median; 3 from beyond $\frac{1}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are very oblique outwardly and somewhat curved between 4 and 5; 6 from stalk just beyond upper angle; 7 from 8, 9 from before middle of 7; 9 from 8 at middle; 10 from stalk of 7, 8, 9 from before 7; 11 from upper median at $\frac{2}{3}$ th; 12 parallel to costa. Hind wing sub-triangular; costa gently arched; termen very oblique, straight, somewhat lobed at 3 and 1*b*; inner margin nearly straight; apex and tornus somewhat rounded; 1*a* long, straight; 1*b* somewhat curved; 2 from middle of discocellulars, which are curved between 4 and 5, straight between 5 to 7; 6 and 7 on a stalk of nearly middle of 6; 8 slightly upcurved at base, then close to upper median with which it runs parallel till near upper angle, then to near apex. In the ♀ the fore wing is more broad and the termen more arched.

Key to South African species:

- | | | |
|------|---|----------------------|
| 1 a. | Shaft of antennae crimson | 2 |
| b. | Shaft of antennae brownish-grey | 3 |
| 2 a. | Fore wing brownish-grey; costa with whitish-grey band from $\frac{1}{3}$ rd of wing to near apex; postmedial line from just before 1 <i>b</i> and extended beyond vein 4 to the black fascia going to apex; abdomen fuscous-black on basal third only, then grey | phyllocampa |
| b. | Fore wing uniform grey; postmedial line from inner margin at $\frac{1}{3}$ rd and running along it till $\frac{2}{3}$ rd, then parallel to tornus and termen as far as vein 4, not connected with the black fascia going to apex; abdomen dorsally fuscous-black for its whole length except the apex, which is irrorated with grey | dasychiroides |
| 3 a. | Fore wing of ♂ brown; a broad oblique whitish band and outer margin beyond the curved black streak whitish; hind wing of ♂ with brown borders | postica |
| b. | Fore wing greyish-fuscous; no whitish band across the wing; hind wing of ♂ white, and with a black patch at tornus only; ♀ with the outer margin very narrowly irrorated with fuscous | concolor |

HOPLITIS POSTICA.

Atrasana postica Wlk. *Cat.* vii. p. 1750 (1856).

Hoplitis postica Trim. *Trans. Ent. Soc. Lond.* p. 7 (1909).

Trimen compares this species with *phyllocampa* and mentions that the shaft of the antennae is arenaceous, a character not mentioned by Walker. The brown border of the hind wing in the ♂ would distinguish this species from all other South African forms in which the hind wings are pure white with a dark patch at the tornus only. There is a possibility, however, that Walker's specimen was a ♀ and not a ♂. This species is not known to me from specimens, though Sir George Hampson informs me that it is the common Transvaal and Natal species.

HOPLITIS DASYCHIROIDES.

(Pl. VII, figs. 7-12.)

Hoplitis dasychiroides Roths. *Nov. Zool.* xxiv. p. 250, Pl. V, fig. 5 (1917).

There can be little doubt that my specimens belong to this species, though there are a few points of difference, but considering that the author had only two ♀s to describe from and that the locality of his specimens is rather remote from South Africa, one would expect some differences.

The branches of the antennae of my specimens are raw sienna (iii) and not black; the abdomen is fuscous-black for nearly the whole dorsal part, though one of my ♂s is more irrorated with grey hairs; the postmedial line is not as distinct in the figure as in some of my specimens, but in one of my ♂s it is almost absent. It is peculiar that some of my specimens were collected together with *phyllocampa* on the same date and in the same locality, and that I did not get any ♀s of *phyllocampa*, but only one ♀ of *dasychiroides*. It is quite well possible that breeding will prove that *dasychiroides* is a variety of *phyllocampa*.

One ♂ from Umtali, 5. 1. '18 (Janse); two ♂s from Emangeni (S. Rhodesia), 18. 1. '18 (Janse); a ♀ from Kourulene (Transvaal), 23. 12. '08 (Mr Robertson); one ♀ from Salisbury (Father O'Neil).

HOPLITIS PHYLLOCAMPA.

Hoplitis phyllocampa Trimen. *Trans. Ent. Soc. Lond.* p. 4, Pl. I, figs. 2, 2a (1909).

My specimens differ very little from the description and the plate. I have six ♂s, all from Emangeni (South Rhodesia), 18, 19. 1. '18 (Janse).

Larva feeds on *Combretum gueinzii* Sond. (E. E. Platt).

HOPLITIS CONCOLOR spec. nov.

(Pl. XIV, figs. 5, 6.)

♂. Head mouse-grey (li) with a transverse fuscous-black (xlvi) fascia before the antennae, mixed with brown in the centre; palpi light buff (xv) on the sides, thickly irrorated with prussian-red (xxxix); hairs at base of antennae pinkish-buff (xxix); shaft tawny-olive (xxix) with some white scales; branches cinnamon-buff (xxix); prothorax pinkish-buff; remainder of thorax, abdomen and ground colour of fore wing smoke-grey (xlvi); patagia edged with pinkish-buff, centre irrorated with fuscous; fore wing irrorated with fuscous and black scales; all markings black; sub-basal line faint, from costa to 1 b, where it forms a black streak towards antemedial line; antemedial line double, faint from costa to lower median at origin of vein 2, then angled inwardly at plical fold and 1 b; a black shading or fascia before it at plical fold; medial line faint, double,

distinct at discocellulars, dentate outwardly at vein 2, plical fold and $1b$; postmedial only indicated by a somewhat darker shading; a broad curved fascia from before tornus to termen at vein 4, broad at inner margin, pointed towards termen, somewhat irregular at the veins; some fuscous-black oblique short strigae between 4 and 5, 5 and 6, 6 and 7; terminus of veins 5, 6, 7, 8 with some black scaling; a faint dark sub-terminal line as far as vein 4; a more distinct terminal line; cilia of ground colour, except at terminus of veins, where there are some black scales. Hind wing shiny white; some dark irroration at costa; a quadrate black patch at tornus between $1b$ and near 2; some black scaling above it; cilia white, except for some black scales at the veins and beyond patch on tornus. Under side: thorax and hairs on legs buff-pink (xxviii); wings and abdomen shiny whitish; fore wing at costal, terminal and inner marginal regions irrorated with fuscous; four white specks at costa near apex; cilia fuscous, with a light basal line, which is interrupted with black at the veins; hind wing with some fuscous antemedial, medial, and postmedial irroration from costa to upper median; cilia as on upper side.

♀. Fore wing with space between sub-basal and antemedial lines very thickly irrorated with fuscous and black; postmedial lines indicated by a double light shading from before black fascia at inner margin to costa; some whitish oblique fascia before and beyond black fascia between veins 5-6, 6-7, 7-8; in cotype a whitish line beyond the black from before tornus to vein 4 and in that specimen the abdomen is pinkish-buff (xxix); hind wing with irroration broader than in ♂; a narrow irroration along outer margin; cilia fuscous at base, whitish at tips except at veins and patch on tornus; patch on tornus with a more distinct white line between upper and lower part and well extended beyond $1b$ to inner margin. Under side with the irroration more dense.

Exp. ♂ type, 52 mm.; cotype, 48 mm.; ♀ type, 63 mm.; cotype, 56 mm.

Hab. ♂ type, Salisbury, 13. 3. '17 (bred by Father O'Neil); ♀ type, Salisbury, 16. 3. '17 (also bred by Father O'Neil); larva feeds on a native bush called "Mutowe"; ♂ cotype, Krantzklouf, 31. 3. '18 (bred by E. E. Platt), all in collection Janse; ♀ cotype from Barberton, 14. 1. '09 (G. W. Jeffery), in collection Transvaal Museum. This species is readily identified by the fascia from near tornus to vein 4, the colour of the shaft of the antennae and the light coloured abdomen.

There is a possibility, that this species and *A. postica* will prove to be the same, but judging from the description it is not so. Sir George Hampson informs me, that *A. postica* is the common Transvaal and Natal species with the black patch at anal angle of hind wing. This, however, gives no clue, as all South African species known to me have such a patch, but it is strange that I have not met with this species yet.

Genus GALONA.

(Pl. V, fig. 10; Pl. VII, figs. 13-17.)

Galona Karsch. *Ent. Nachr.* XXI. p. 363 (1895).

Type *serena*.

♂. Proboscis absent; palpi porrect, short, but longer than in *Amyops*, just reaching frons, densely covered with hair-like scales; first joint with rather long tuft in front; second joint longer than first, sub-cylindrical; third joint nearly half of second, somewhat pointed; eyes naked, large and rounded; antennae about half of costa, bipectinate except near the tip, which is bi-

serrate; branches long, longer than in *Amyops*, about 8 times shaft, ciliated on anterior side; fore tibia with moderate, narrow, pointed process, hidden in long dense hairs; mid tibia with terminal pointed spurs, nearly as long as half of first tarsal joint; hind tibia with two pairs of spurs, slightly curved at the points; all femora and tibiae densely covered with long hairs; tarsi of all legs with spines on inner side and covered with scales and hair-like scales; claws, large, curved. Fore wing rather broad, sub-triangular; costa slightly incurved; apex rounded; termen obliquely rounded, sub-crenulate; tornus well rounded; inner margin excurved; $1b$ forked at base; 2 from beyond $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle, well curved; 5 from above middle of discocellulars, which are curved at lower half and have an indistinct forked veinlet in cell; 6 from just below upper angle; 7 touching stalk of 8, 9 at middle of 7 to form a long areole, which is longer than half distance from upper angle to apex, and very narrow; 8 and 9 stalked for half length of 8 beyond end of areole; 10 from areole at $\frac{4}{5}$ th; 11 from upper median at about $\frac{2}{3}$ rd; 12 parallel to costa. Hind wing triangular; costa much excurved at middle; apex rounded; termen rounded; sub-crenulate; tornus well rounded; inner margin rounded; $1a$ straight; $1b$ somewhat curved; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd distance 2 to 4; 4 from lower angle, curved; 5 from middle of discocellulars, which are erect, straight, and have a faint veinlet at lower half into the cell; 6 and 7 stalked for nearly half of 7, and from upper angle; 6 well curved; 8 closely parallel to upper median till end; upper median incurved at basal half, excurved at terminal half; frenulum rather long.

GALONA SERENA.

(Pl. V, fig. 10; Pl. VII, figs. 13-17.)

Galona serena Karsch. *Ent. Nachr.* XXI. p. 363, Pl. III, fig. 1 (1895).
 ♀. *Galona pyrrottricha* Karsch. *Ent. Nachr.* XXI. Pl. III, fig. 2 (1895).

I have no doubt that the South African specimens I have seen belong here, though there are a few points of difference. No mention is made of the black postmedial curved streak from vein 3 to inner margin and it is also not shown in the figure of the ♂, but it is present in the figure of the ♀; the head, thorax, antennae and legs are dark fuscous, not black as stated; no mention is made of the dark fuscous abdominal patch on dorsal side; the white of the fore wing and tegulae has a pinkish tinge and is not pure white and my ♂s are somewhat larger, 50 mm.

I have further seen a ♀ from Shamva (S. Rhodesia), which is in Father O'Neil's collection, which clearly shows that *G. pyrrottricha* is the ♀ of *G. serena*.

One ♂ in my collection is from Que-que (South Rhodesia), kindly presented to me by Dr Péringuey, and I have another badly damaged ♂ from the same locality. No dates were given.

The ♀ was taken in Dec. 1917 and has the white of the fore wing and tegulae distinctly pink.

Genus AMYOPS.

(Pl. V, figs. 11-14; Pl. VII, figs. 18, 19.)

Amyops Karsch. *Ent. Nachr.* XXI. p. 362 (1895).

Melebaeas Dist. *Ins. Transv.* IV. p. 93 (1903). (Type *gigas*.)

Type *ingens*. Description from *gigas*.

♂. Proboscis absent; palpi very short, porrect, hardly reaching frons; first joint as big as second and third together; third joint very small, globular;

first and second joints with scale-like hairs on under and upper side; eyes very large, round, naked; antennae about $\frac{1}{3}$ rd of costa, bipectinate except last ninth part; pectination about four times shaft, gradually tapering towards apex, which is serrate; first joint of shaft with a dense tuft of hair; fore tibia with a somewhat curved, broad process, rounded at tip, nearly as long as tibia and towards the inner side fringed with long hairs; mid and hind tibiae with two terminal spurs which are short and pointed; femora and tibiae of all legs covered with very long hairs; tarsi of all legs on inner side with a large number of spines and further covered with scales.

Fore wing rather long; costa nearly straight, except the apical part which is well rounded; apex somewhat rounded; termen obliquely rounded; inner margin straight; $1b$ well curved at base; 2 from lower median at beyond $\frac{2}{3}$ rd; 3 from well before lower angle; 4 from lower angle; 5 from middle of discocellulars which are erect; 6 from before $\frac{1}{3}$ rd of areole; 7 from just before end of areole; 8 and 9 from end of areole, stalked for over middle of 8; 10 from upper median at $\frac{8}{9}$ th, then anastomosing with stalk of 8, 9 a little beyond 7 to form the areole, which is narrow and as long as half length of vein 10; 11 from upper median at $\frac{2}{3}$ rd; 12 parallel to costa. Hind wing triangular; costa very much arched; termen obliquely rounded; inner margin rounded; apex and tornus well rounded; $1a$ and $1b$ nearly straight; 2 from $\frac{2}{3}$ rd lower median; 3 from well before lower angle; 4 from lower angle; 5 from middle of discocellulars, which are erect; a forked veinlet into the cell; 6 and 7 from upper angle, stalked for less than half of 6; 8 free, remote and parallel to upper median, then to apex; frenulum very long; abdomen with dorsal and lateral tufts of spreading hairs.

I have no doubt that *Melebaeas* Dist. and *Amyops* are the same, though there is one small difference; vein 6 of fore wing namely does not come from the upper angle, but from the areole. This character varies, however, in species of other genera as well. Distant's brief description is insufficient, but as I am sure of the correct identification of my specimens, as the very good figure enables one to be, I could very carefully compare this genus with the fairly full description given by Karsch. I do not think that this genus is directly related to *Hoplitis*, as one would think from Distant's comparison, as *Hoplitis* has no areole, 4 spurs on the hind legs; upturned and quite long palpi; and the shape of the fore wing is very different. Only one species is found so far in South Africa, the other species (*A. ingens* Karsch) is from Togo.

AMYOPS GIGAS.

(Pl. V, figs. 11-14; Pl. VII, figs. 18, 19.)

Hoplitis gigas Dist. *A.M.N.H.* 7. III. p. 463 (1899).

Melebaeas gigas Dist. *Ins. Transv.* IV. p. 93, Pl. IV, fig. 6.

I think the description was drawn up from a very poor, faded specimen; the colour description does not correspond with the figure in many ways. The plate, however, is very good.

There is a possibility that Karsch's *A. ingens* is the same as *A. gigas*; they are, at any rate, very much like each other.

I have this species from Barberton (Miss de Beer); and a fine ♂ from S. Rhodesia (Umtali), 5. 1. '18 (Janse).

Genus *PHYCITIMORPHA* nov.

(Pl. VIII, figs. 1-5.)

Type *stigmatica* spec. nov.

♂, ♀. Proboscis present; frons with a rounded prominence covered with scales and short hairs; palpi upturned, rather long, reaching vertex of head; first joint small; second joint long, narrow, cylindrical, slightly curved; third joint as long as first, roundly pointed; all joints covered with scales and hair-like scales, in front moderately fringed with scales; eyes large, rounded, smooth; antennae over half of costa, bipectinate till tip in ♂, till near tip in ♀; pectination in ♂ four times shaft and with cilia on two sides, in ♀ two times shaft; a very small scale-tuft on first joint of shaft; thorax covered with rather loose scales; legs rather slender, mainly covered with scales; femora sparingly fringed with moderately long hairs; tibiae fringed with rather short hairs on inner and outer sides; fore tibia rather short, about $\frac{2}{3}$ rd of femur, and with a hollow process which ends in a point and does not reach till end of tibia; first joint of tarsi very long, longer than tibia (in one specimen both fore legs have four tarsal joints, but in the other two specimens there are five), and they are covered with scales on outer, with scales and spines on inner side; mid tibia with two spurs; hind tibia with four spurs; longest spur about $\frac{1}{3}$ rd of tibia, outer spur $\frac{2}{3}$ rd of inner; spurs covered with scales, and ending in a nearly straight naked point. Fore wing rather narrow in ♂, a little broader in ♀; costa slightly curved, in ♀ a little more curved; apex rounded; termen erect and straight till vein 4, then curved towards tornus, which is rounded; inner margin straight; 1*b* forked at base, straight; 2 from before $\frac{3}{4}$ th lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from above middle of discocellulars, which are erect; areole broad, length a little over two times breadth; 6 from areole well before the end; stalk of 7, 8, 9 from end of areole; 7 from $\frac{1}{3}$ rd distance end of areole to apex; 9 from stalk at half that distance; 10 from areole at middle; 11 from upper median at $\frac{1}{3}$ rd; 12 parallel to costa. Hind wing nearly trapezoid; costa slightly arched; apex rounded; termen oblique and gently curved from apex to vein 3, then forming a rounded lobe and then oblique to tornus; tornus well rounded; inner margin straight; 1*a* and 1*b* somewhat curved; 2 from lower median at a little beyond middle; 3 and 4 from lower angle; 5 from just above middle of discocellulars, which are erect at upper and oblique at lower part; 6 and 7 stalked for $\frac{1}{3}$ rd of 6; 8 approximated to upper median at before middle, then straight to apex. This genus comes evidently near *Scrancia*, from which it differs, however, in many respects. It contains two species at present, which may be distinguished as follows:

- 1 a. Branches of antennae of ♀ two times shaft; fore wing with a linear stigma; 7 from stalk of 8, 9 **stigmatica**
 b. Branches of antennae of ♀ only once the shaft; fore wing with the stigma round; 7 from end of areole. **congruata**

PHYCITIMORPHA *STIGMATICA* spec. nov.

(Pl. XIV, fig. 8; Pl. VIII, figs. 1-5.)

♂, ♀. Ground colour of fore wing, thorax and legs light drab (xlvi), thickly irrorated with fuscous-black except mid and hind legs, which are thinly sprinkled with it; palpi fuscous (xlvi); frons saccardo's umber (xxix) mixed with fuscous-black hairs; patagia cream-buff (xxx) mixed with orange-rufous (ii); vertex orange-rufous mixed with fuscous-black; a black patch of hairs in

centre of vertex and between patagia; branches of antennae bone-brown (xl), of shaft, tilleul-buff (xl); abdomen cream colour tinged with drab (xlvi); fore wing sub-basal only represented by a few black scales; antemedial line black, rather sharply defined and erect, followed by a light coloured line of ground colour, very oblique below costa, then angled inwardly at cell and below lower median; medial line black, well defined, erect and preceded by some whitish scales, angled inwards along upper median, curved in and below cell and outwardly oblique beyond vein $1b$; a long and narrow black stigma at end of cell, surrounded by a ring of ground colour; postmedial line erect, double, inner one diffused fuscous-black and followed by whitish scaling, outwardly oblique to stalk 7, 8, 9, then incurved between stalk and vein 4, then excurved at vein 3, incurved below vein 2 and angled outwardly at $1b$; a dark diffused sub-terminal shading from near apex to tornus and preceded by diffused light scaling, which begins along costa where there are two whitish points; the shading is irregularly dentate on the veins, incurved at vein 5 and excurved at 3; a distinct black terminal line from costa to $1b$, interrupted on the inner side by the veins; cilia of ground colour. Hind wing of ♂ pure white, with a fine buffy-brown (xl) terminal line; cilia white; in the ♀ the hind wing is also pure white, but very thinly irrorated with fuscous and the terminal line is fuscous. Under side: fore wing uniform hair-brown (xlvi), hind wing pure white in ♂, the ♀ has the medial line represented by dark irroration and the terminal half of the wing is irrorated with fuscous-black.

Exp. ♂, 34 mm.; ♀, 32 mm.

Hab. ♂ type from Umvuma, 25. 12. '17; ♀ type from Shangani (S. Rhodesia), 10. 5. '18 (Miss Chamberlain); a ♂ cotype from Karkloof (Natal), 24. 1. '17 (Janse).

PHYCITIMORPHA CONGRUATA spec. nov.

(Pl. XIV, fig. 7.)

It is possible that a new genus has to be formed for this species, but as I have only one ♀, I place it provisionally here, though it differs from the typical species in the following points: palpi more densely scaled in front and less upturned; frons with a tuft of rather long hairs; antennae with the branches as long as thickness of shaft; fore wing with 7 from end of cell; hind wing with 3 a little apart from 4; stalk of 6, 7 a little shorter and 8 connected with the upper median by a short bar at about middle; shape of fore wing still more like a *Pyraline* and hind wing more ample.

♀. Ground colour of head at sides, thorax, abdomen, legs and fore wing light mouse-grey (li); hind wing suffused with the same colour; palpi at sides sprinkled with white; frons with a tuft of fuscous hairs (xlvi); patagia tipped with white scales; fore wing with a fine sub-basal line, which is black and well defined, from obliquely inwards to upper median, then outwardly oblique below lower median, then curved inwards to vein $1b$; antemedial line black, well defined, very near to medial line, from costa erect to vein 11, then along this vein to upper median, then angled outwardly into the cell, then erect to near lower median, then obliquely inwards to origin of vein 2, then angled outwards below vein 2 and obliquely inwards to plical fold, then erect to inner margin; medial line broad, very diffused, erect from costa to inner margin; a dark, rounded stigma on discocellulars, partly filled in and surrounded with white scales; postmedial line double, black, with scales of ground colour before, between and beyond it; from costa to vein 4 erect, second line indistinct from costa to vein 6; the two lines are very broad between 6 and 4, then thin again and oblique to vein 2 where the first line ends, the second line is continued as

a faint shading; some light coloured sub-terminal series of elongated spots on the veins from costa to tornus and two fuscous-black elongated spots along the costa between postmedial and sub-terminal lines; some black irroration before and beyond sub-terminal lines on veins 1*b* to 6; a terminal black line, interrupted on inner side of the veins; a vinaceous-fawn (xl) tinge except on veins and along costa on the area before medial line and beyond postmedial line; cilia vinaceous-fawn with a lighter basal line; hind wing shiny pallid mouse-grey (li) suffused on the veins with light mouse-grey; a suffused discoidal light drab (xlvi) mark; an indication of a postmedial light drab suffusion, while there are on the veins black scales; sub-terminal and terminal area suffused with light drab with a sub-terminal black scaling on the veins; a hair-brown (xlvi) diffused terminal line interrupted on the veins; cilia of ground colour.

Under side of both wings pallid mouse-grey; fore wing densely suffused and irrorated with hair-brown; a dark suffusion on discocellulars and a postmedial diffused line from costa to vein 4; terminal lines of both wings fuscous-black; hind wing very little irrorated with hair-brown except on terminal area; a black suffusion on end of cell representing postmedial line; cilia as on upper side; on hind tibia some black scaling in the region of the median spurs.

Exp. 41 mm.

Hab. From S. Rhodesia (Sawmills), 1. 2. '18 (Janse). One specimen only.

Genus SCRANCIA.

(Pl. V, fig. 15; Pl. VIII, figs. 6-13.)

Scrancia Holl. *Psyche*, vi. p. 537 (1893).

Auriv. *Arkiv för Zool.* Bd. 2. No. 4, p. 7 (1904).

Type *modesta* Holland. Description from *stictica* Hmps. n.

♀. Proboscis well developed; palpi obliquely upturned, reaching well above vertex of head; first joint rather short, curved; second joint long, tapering towards end; third joint oblique, narrow and shorter than first joint, almost hidden in hairs; palpi covered in front mainly with hairs, at sides and above mainly with scales; frons produced towards proboscis, where it forms a raised toothed ledge with a tooth-like projection on each side (this is shown in the figure from the side and from above after the scales have been removed and the palpus has been pushed out of position); the whole is covered with scales so as to form a short tuft; eyes large, rounded, naked; antennae over half of costa, bipectinate for $\frac{2}{3}$ rd of their length; branches very short, two or three times shaft, ciliated terminally and on the anterior side; legs very long and slender, smoothly covered with scales and a few long hairs; fore tibia with a keel-shaped process, as long as half of tibia and provided on the edges with a row of comb-like spines; first joint of tarsus about as long as tibia; mid tibia with a pair of terminal long spurs, outer one about $\frac{2}{3}$ rd of inner spur; hind tibia with two pairs of long spurs, outer spur $\frac{2}{3}$ rd inner one and all spurs covered with scales and well pointed; all tarsal joints very long, especially the first joints, and on inner side covered with a number of spines.

Fore wing long and narrow; costa well arched; apex nearly acute; termen very oblique and rounded; inner margin nearly straight; 1*b* well forked at base; 2 from beyond $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from just above middle of discocellulars, which are erect; 6 from areole just beyond upper angle; areole broad, about two times as long and shaped like a parallelogram; 7 and stalk of 8, 9 from end of areole and very slightly stalked; 9 from

just beyond middle of free part of 8; 10 from middle of areole; 11 from upper median at about $\frac{2}{3}$ rd, somewhat curved towards vein 10 at areole, but not touching it; 12 parallel to costa.

Hind wing broad, nearly semicircular; costa somewhat excurved at middle; apex well rounded; termen very oblique and well rounded; tornus rounded; inner margin straight; 1*a* and 1*b* straight; 2 from lower median a little beyond middle; 3 and 4 from a point at lower angle; 5 from above middle of discocellulars and weak; discocellulars very weak, erect; 6 and 7 very shortly stalked and from upper angle; 8 parallel and approximated to upper median from base to beyond middle, then towards near apex; frenulum consisting of two bristles only. I have only seen ♀s, and at first thought the specimens to belong to the genus *Gargetta*, but the differences given by Holland between *Scrancia* and *Gargetta* are all found in my specimens. Besides some of them come from the same collection (E. L. Clark's) and the same locality as the type specimens of Hampson's *S. stictica*, and they all agree well with the description of this species. So I have no doubt, that my identification is correct, though the description given by Holland is very slender, even with the additional description of *Gargetta* given in Hampson's *Moths of India*. Sir George Hampson here divides the genus *Gargetta* into three sections, two of which have pectinated antennae, as given by Holland for *Scrancia*, and one of these sections has the name *Thacona*, treated as a synonym of *Gargetta*. As Hampson recognises the genus *Scrancia* in 1910 as a genus and not as a section or subgenus for the two South African species, there are no doubt other differences which I cannot make out from the descriptions. Five species are recorded from Africa, two of which occur in South Africa.

- 1 a. Head and thorax brown, mixed with grey; ground colour of fore wing light brownish-grey; discoidal striga black, defined by ground colour **stictica**
- b. Head black; thorax and ground colour of fore wing fuscous-brown; whitish discoidal striga defined by black and with ochreous beyond and before it **atrifrons**

SCRANCIA STICTICA.

(Pl. V, fig. 15; Pl. VIII, figs. 6-13.)

Scrancia stictica Hmps. *A.M.N.H.* 8, v. p. 480 (1910).

I have one fine ♀ from Umtali (S. Rhodesia), 9. 1. '18 (Janse), which is more grey than the Natal specimen; all Natal specimens I have seen are more brownish-grey; 3 specimens in my collection from Durban caught in March (E. L. Clark).

SCRANCIA ATRIFRONS.

Scrancia atrifrons Hmps. *A.M.N.H.* 8, v. p. 481 (1910).

I have one ♀ in my collection which I think belongs here, though it has white points on veins 1*b* to 6, which interrupt the otherwise continuous fine black terminal line, and though it has some whitish scaling before antemedial and beyond postmedial lines, all characters which are not mentioned in the description. It is also larger, 40 mm. instead of 30 mm. The other characters, however, correspond so well with the description that I prefer to keep it provisionally here, instead of describing it as new.

Caught at Salisbury on 27. 12. 17. (Janse).

Genus TAENIOPTERYX nov.

(Pl. VIII, figs. 14-19.)

Type *cinerea* spec. nov.

♂, ♀. Proboscis present; frons rounded; palpi obliquely upturned, moderate; second joint about two times first joint; third joint somewhat porrect, small, covered with appressed scales at sides and scales and hairs at the front; eyes large, rounded, naked; antennae less than half of costa, bipectinated in both sexes for nearly $\frac{2}{3}$ rd, pectination in ♂ about three times shaft, in ♀ two times shaft; first joint of shaft sub-globular and with a tuft of hairs; femora rather thinly covered with long hairs; tibiae with moderate hairs on outer side; fore tibia with a process shorter than the tibia; mid tibia with two, hind tibia with four spurs, which are moderate in length and sharply pointed, outer spur about $\frac{1}{3}$ th of inner spur and all covered with hair-like scales; tarsi covered with scales and spines. Fore wing narrow; costa well rounded; apex rounded; termen very oblique, somewhat rounded between veins 2 and 5; tornus well rounded; inner margin straight; 1*b* forked at base; 2 from lower median at beyond $\frac{1}{3}$ th; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from well above middle of discocellulars, which are erect and straight; 6, 7, 8, 9, 10 stalked and from upper angle; 6 from $\frac{1}{3}$ rd whole length of 8; 7 from $\frac{2}{3}$ rd of 8; 9 from $\frac{5}{6}$ th of 8; 10 from middle of origin of 6 and 7; 11 from upper median at $\frac{1}{3}$ th; 12 parallel to costa. Hind wing triangular; costa straight; apex rounded; termen very oblique, somewhat roundly lobed at 3 and 4 and incurved at vein 2; tornus well rounded; inner margin roundly lobed at 1*a*; 1*a* and 1*b* straight; 2 from $\frac{2}{3}$ rd lower median; 3 and 4 from lower angle and on a stalk of $\frac{1}{3}$ rd of 4; 5 absent; discocellulars faint, erect, curved; 6 and 7 from upper angle, stalked for over $\frac{1}{3}$ rd of 7; 8 from upper median at middle, then oblique to apex. Abdomen with a tuft of hair at base. This genus is close to *Stenostaura*, from which it differs in the position of veins 3 and 4 of fore wings, position and structure of the larger palpi and the presence of four spurs on the hind legs.

TAENIOPTERYX CINEREA spec. nov.

(Pl. XIV, fig. 9; Pl. VIII, figs. 14-19.)

♂, ♀. Palpi black, irrorated with neutral grey (lii) at the sides; head and tegulae of ♂ with cream-buff (xxx) and burnt sienna (ii) hairs and scales; remainder of thorax above and on under side, and legs neutral grey; tibiae and tarsi ringed with fuscous-black, tipped with white; fore wing at base and beyond medial line thickly irrorated with black and fuscous-black; remainder of fore wing between outer sub-basal and inner antemedial line, more or less irrorated with burnt sienna, so as to form a brownish band; sub-basal line double, black, diffused, curved and somewhat angled inwardly at lower median; antemedial line double, outer line most defined, curved and somewhat angled inwardly at upper median (in the ♀ the outer sub-basal and inner antemedial lines are brownish); medial line indistinct; a buff-yellow (iv) elongated stigma at discocellulars, centred with burnt sienna; in ♀ and in ♂ cotype the yellow is very faint; postmedial line double, faint and indistinct, often disappearing; a fine distinct black line, irrorated with brown in the ♀, from apex to tornus; some black scales on veins beyond the postmedial line; cilia deep neutral grey (liii), a little lighter at base. Hind wing white; some fuscous irroration along costa and a narrow terminal shading of fuscous; cilia white, with a fuscous line at middle.

Under side: fore wing uniform hair-brown (xlvi); hind wing white with hair-brown irroration along costa and hair-brown terminal shading; cilia white.

Exp. ♂, 25 mm.; ♀, 29 mm.

Hab. ♂ type from New Hanover (Hardenberg, 8. '17); ♀ type from Durban (v. d. Merwe, 6. 3. '17); a ♂ cotype from Emangeni (S. Rhodesia), 18. 1. 18 (Janse); and another worn ♂ specimen from Valdesia (Zoutpansberg distr.) in Nov. 1915 (Mr T. Robson).

Genus BREYERIA nov.

(Pl. V, fig. 16; Pl. VIII, figs. 20-25.)

Type *dasychiroides* spec. nov.

♂. Proboscis absent; eyes moderate, elliptical; frons rounded, covered with hairs forming a ridge in the middle; palpi porrect, short, just reaching frons; first and second joints about of equal length; third joint a little over half of second, pear-shaped; all joints with rather long hairs in front, mixed with some scales; antennae about half length of costa, bipectinate till tip; branches long and spreading, 6 to 8 times shaft and with long cilia in front; tuft on first joint of shaft moderate; a slight tuft of scales on metathorax; a crest of long, spreading hairs on first segment of abdomen; femora thinly fringed with long hairs on inner side, otherwise covered with scales; femur of fore leg with some scales amongst the hairs; tibiae covered with scales on outer side; tarsi covered with appressed scales mixed with spines on inner side; fore tibia with a rather thin undulating process just reaching till a little beyond tibia and curved a little outwardly; mid tibia with two, hind tibia with four spurs, which are about as long as half of first tarsal joint; spurs covered with hairs, except near the tip, which is sharply pointed and almost straight, and with vestigial rows of teeth; outer spur about $\frac{1}{4}$ th shorter than inner. Fore wing elongate triangular; costa nearly straight, curved towards apex; apex slightly rounded, termen fairly erect, and curved from 2 to 6; tornus rounded; inner margin with a slight rounded lobe on basal half; 1*b* apparently without a fork; 2 from $\frac{3}{4}$ th of lower median; 3 from a little beyond middle of 2 to 4; 4 from lower angle; 5 rather weak and from above middle of discocellulars which are faint, erect and somewhat curved; 6 from $\frac{3}{4}$ th of areole; areole large, about four times as long as broad; 7, 8, 9 stalked and with vein 10 from end of areole; 7 from stalk at half the distance upper angle to apex; 8 from $\frac{3}{4}$ th that distance; 11 from upper median at $\frac{3}{4}$ th and somewhat curved; 12 parallel to costa. Hind wing triangular with rounded corners; costa somewhat arched; apex somewhat rounded; termen very oblique and curved from 2 to 7; tornus well rounded; inner margin well arched; 1*a* and 1*b* practically straight; 2 from lower median at $\frac{2}{3}$ rd; 3 from $\frac{3}{4}$ th distance 2 to 4; 4 from lower angle; 5 rather weak, from just above middle of discocellulars, which are faint and very oblique outwardly; 6 and 7 on a stalk of over $\frac{1}{3}$ rd; parallel to upper median to end, then much curved.

On account of the broader fore wing, longer areole and longer pectination, it is brought in the key into the *Zana-Chadisra* group, but I do not think that this is its natural position. I rather think it related to *Phycitimorpha* from which it differs in vein 10 of fore wing coming from the end of the areole, different shape of areole, the hind wing having 3 and 4 apart, discocellulars being much more oblique and vein 5 from well above middle; the fore wing is much shorter and broader, the process of the fore tibia is totally different, the palpi are much shorter and are porrect.

BREYERIA DASYCHIROIDES spec. nov.

(Pl. XIV, fig. 10; Pl. V, fig. 16; Pl. VIII, figs. 20-25.)

♂. Hairs on head and thorax above light mouse-grey (li), densely irrorated with black; palpi black, fringed with light mouse-grey hairs in front; shaft of antennae drab (xlvi), branches fuscous (xlvi); abdomen above vinaceous-buff (xl), on under side whitish; fore wing with ground colour white, densely irrorated with fuscous and fuscous-black (xlvi), especially dense between sub-basal and antemedial lines, postmedial and sub-terminal lines; area before sub-basal line opaline-green (vii) with a few black scales here and there; sub-basal line black, faint from costa to lower median, then forming a long tooth outwardly below lower median, which is well defined and continued as a line to antemedial line, then erect to 1a and still distinct, then forming an indistinct tooth with rounded point above inner margin; a fuscous striga beyond sub-basal line from costa to upper median; antemedial line black, distinct, inwardly oblique from costa to upper median, then curved outwards and still more oblique to plical fold, where it is connected with the black streak from sub-basal line, then erect to inner margin; a fuscous diffused line before it from costa to lower median; medial line diffused, fuscous, nearly straight and inwardly oblique, preceded in the cell by some opaline-green scales; in the cell the medial line is narrow and black and followed by a pure white reniform, which is outwardly edged by a black inwardly curved striga; postmedial line double, inwardly oblique from costa to areole, then curved outwards till vein 3 and still oblique, then curved inwardly to vein 2, then erect to inner margin, meanwhile outwardly curved at plical fold and inwardly just above 1b; inner postmedial line black and well defined, outer line fuscous, sharply defined on inner side, but becoming diffused on outer side except from costa to areole, where it is well defined on both sides and fuscous-black; two oblique fuscous dashes from costa to vein 10, last dash followed by a larger and darker striga along stalk of 8, 9; a rather broad black line beginning on vein 7 at sub-terminal line, well curved obliquely to vein 3 at about middle of that vein, then curved inwards between veins 3 and 2, and diffused, then outwardly oblique and diffused to tornus; some opaline-green scaling before it between costa and vein 3, and with no irroration beyond it between vein 5 and tornus; a very fine sub-terminal black line, continuous from apex to vein 4, then becoming erect and zig-zagging on the veins; the irroration is almost absent between antemedial and medial lines from lower median to inner margin and between medial and postmedial lines over the whole breadth of wing; cilia of ground colour checkered with white on the veins. Hind wing pure white; cilia white. Under side: fore wing and hind wing pure white; fore wing densely suffused with fuscous along the costa and along terminal area from postmedial line near costa obliquely to tornus; a postmedial dark ill-defined line from costa to vein 2; cilia fuscous, at veins whitish; thorax and legs tilleul-buff (xl); three black lines on the tibia; first tarsal joints irrorated with black, other joints quite black at front.

Exp. 29 mm.

Hab. ♂ type, Nelspruit, 19. 10. '17 (Dr H. G. Breyer), in collection Transvaal Museum; ♂ cotype collected at the same time and place in coll. Janse.

Genus STENOSTAURA.

(Pl. V, fig. 17; Pl. IX, figs. 1-4.)

Stenostaura Hmps. *Trans. Zool. Soc.* XIX. p. 119, Pl. IV, fig. 45 (1909).Type *impedita* Wlk.

♂, ♀. Proboscis absent; palpi minute, porrect, three jointed; all joints of equal length and covered with rather long spreading scales and hairs; eyes large, rounded, naked; antennae bipectinated for over half, in ♂ the outer branches are three times shaft, inner branches two times shaft; in ♀ outer branches two times, inner branches once; beyond the pectinations the shaft is serrate and ciliate in both sexes; pectinations ciliated; basal joint of shaft with a tuft of hairs and scales; fore tibia with a rather short pointed process; tibiae and femora of all legs covered with long hairs, tarsi with scales; mid and hind tibiae with terminal spurs only, inner spur shorter than outer spur. Fore wing narrow; costa nearly straight; apex rounded; termen obliquely rounded; tornus rounded; inner margin nearly straight; 1*b* indistinctly forked; 2 from beyond $\frac{3}{4}$ rd lower median; 3 and 4 from lower angle or shortly stalked; 5 from above middle of discocellulars, which are oblique; 6 stalked with 7, 8, 9, 10 for nearly $\frac{1}{3}$ rd of 6; 7 from stalk at beyond middle of 8; 9 from 8 at half the remainder part of 8; 10 from about half way 6 and 7; 11 from beyond $\frac{3}{4}$ rd upper median; 12 parallel to costa. Hind wing sub-triangular; costa nearly straight; apex well rounded; termen oblique, rounded and somewhat lobed between 2 and 5; tornus rounded; inner margin nearly straight; 1*a* and 1*b* nearly straight; 2 from $\frac{3}{4}$ rd lower median; 3 and 4 on a stalk of nearly half of 2; 5 almost absent (only somewhat visible in wing preparation); 6 and 7 on a stalk of over $\frac{1}{3}$ rd of 6; 8 anastomosing with upper median for nearly half of cell, then parallel to costa and somewhat curved towards apex.

The figure given by Sir George Hampson is not quite correct; in the fore wing, 3 and 4 are not shown from upper angle, 10 is given from before 7; pectinations of antennae are much too far towards the tip; in the description nothing is said about the faintness of vein 5, though it is shown in the figure.

Only one species is known in this genus.

STENOSTAURA IMPEDITA.

(Pl. V, fig. 17; Pl. IX, figs. 1-4.)

Cossus impeditus Wlk. *Cat.* XXXII. p. 583 (1865).*Stenostaura impedita* Hmps. *Trans. Zool. Soc.* XIX. p. 120, Pl. IV, fig. 45.

Why this species was placed by Walker in the *Cossidae* is a mystery to me; even without looking at the venation, it is clearly a Notodontid. The terminal line shown in Hampson's figure is wrong according to my specimens; it should be represented by black terminal broad spots on the veins only.

I have no doubt that my specimens belong here; the description of the genus and the figure of the species make this a certainty, though there is some variation in several of my specimens. In the ♀s the transverse lines are more diffused and one of my ♀s from Sawmills shows a very marked white clouding before the sub-terminal line. The hind wings of the ♀s are, as a rule, not pure white, but suffused with fuscous.

This species is recorded from the Cape and from Mokia (S. E. Ruwenzori). I have it from Pretoria (Jan., Oct., Nov.); Barberton (Jan., Dec.); Watervul onder (Nov.); Three Sisters (March); Warmberg (Nov., Dec.) (all in the Transvaal); and from Southern Rhodesia (Sawmills, in Febr.).

Genus EURYSTAURA nov.

(Pl. IX, figs. 5-9.)

Type *brunnea* spec. nov.

♂, ♀. Proboscis absent; palpi very short, hardly reaching frons, obliquely upturned in ♂, in ♀ nearly porrect; first joint somewhat curved and shorter than second joint, which is a little thicker at middle; third joint about half of second; palpi thickly covered with hairs and scales and with a tuft of hairs and scales on front of first joint; frons oblique and with a tuft of long hairs; eyes smooth, rather large, elliptical; antenna short, less than half of costa, curved downwards and with a tuft of hairs in front of first joint, bipectinated for $\frac{4}{5}$ th, when it becomes serrate; pecten in ♂ about 6 times shaft, in ♀ a little over once the shaft; thorax and abdomen without crests; femora with long hairs on inner side, tibiae of mid and hind legs with long hairs on outer side, tibia of fore leg with shorter hairs; fore tibia with an almost straight process, not quite reaching end of tibia; mid tibia with two, hind tibia with four spurs; longest spur nearly as long as first tarsal joint of hind leg; outer spurs a little longer than half of inner spur; all spurs covered with hairs except at the tip, which is sharply pointed and curved, but without any teeth; tarsi with hairs and scales but no spines. Fore wing moderately broad, a little less than half; costa slightly hollow at middle, well arched towards apex, which is somewhat rounded; termen oblique; tornus somewhat rounded; inner margin curved near base; *1b* nearly straight, indistinctly forked at base; 2 from nearly $\frac{3}{4}$ th lower median; 3 from beyond $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are nearly erect at lower half and inwardly oblique at upper half; 6 very slightly stalked with stalk of 7, 8, 9, 10, stalk from upper angle; 7 from stalk beyond half the distance upper angle to apex; 9 from middle of free part of 8; 10 from middle of stalk 8, 9; 11 from upper median beyond $\frac{3}{4}$ th; 12 parallel to upper median, then straight to costa. Hind wing semi-circular; costa slightly bulged at middle; apex rounded; termen very oblique, slightly sinuate, especially between *1b* and 2; tornus well rounded; inner margin rather short, straight; *1a* and *1b* straight; 2 from well beyond middle of lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 very weak, almost absent, and from a little above middle of discocellulars, which are erect and somewhat curved; 6 and 7 on a stalk of nearly half of 6; 8 from upper median a little beyond middle.

This genus differs from *Stenostaura* in the stouter build, in having four spurs on the hind legs, in veins 3 and 4 of fore wing being remote and 6 from stalk at base, while in the hind wing 3 and 4 are also remote and not stalked.

EURYSTAURA BRUNNEA spec. nov.

(Pl. XIV, fig. 11; Pl. IX, figs. 5-9.)

♂, ♀. Head, palpi at sides, patagia, thorax and abdomen above and on under side and ground colour of fore wing on upper side sayal-brown (xiv), irrorated with kaiser-brown (xiv); tegulae, part of fore wing except along costa as far as upper median, a streak from lower median and vein 2 till plical fold, and inner marginal area as far as *1b* very thickly tinged with clove-brown (xl); sub-basal, antemedial and medial lines almost obsolete and only indicated by some light dashes of ground colour on costa and some dark scaling on veins; a rounded patch of ground colour just before discocellulars, traversed by a narrow fairly distinct part of the medial line, angled inwards at discal fold;

beyond this light patch a spot of whitish scales on lower and upper angles, surrounded by a black edging, so as to form the figure 8, lower spot larger than upper; postmedial line fairly distinct, but diffused, double and fuscous-black, angled inwardly at stalk 7, 8, 9, 10, then curved obliquely to plical fold, then more erect and angled inwardly above $1b$ and outwardly below $1b$; the outer line is only distinct on the veins; some dashes of ground colour beyond it at costa; sub-terminal line rather diffuse, from near apex to tornus, somewhat incurved at vein 5 and plical fold, fuscous-black and followed by some light scaling, dentate outwardly on the veins; some terminal dark scales on the veins; cilia clove-brown with a few sayal-brown scales opposite the veins. Hind wing orange-cinnamon (xxix) with an indistinct medial line of lighter colour; cilia warm sepia (xxix) tipped with whitish.

Under side: of both wings orange-cinnamon; fore wing with a few light coloured dashes on the costa near apex; shaft of antennae kaiser-brown; branches black.

Exp. ♂, 34–30 mm.; ♀, 34 mm.

All specimens are from Durban, most of them bred by Mr G. F. Leigh. ♂ type, Febr. '16, ♀ type, March, '07, in collection Janse. Other cotypes of Febr. '16, 14–17. 11. '02 in collections of Transvaal and South African Museums, and in my own.

Genus NOTOXANTHA.

(Pl. V, fig. 18; Pl. IX, figs. 10–17.)

Notoxantha Hmps. *A.M.N.H.* 8. v. p. 484 (1910).

Type *sesamiodes*.

♂, ♀. Proboscis short, but functionary; palpi obliquely upturned, just reaching vertex of head; first joint curved; second joint cylindrical and as long as two times first joint; third joint very small, hidden in hairs; rather long hairs in front, mixed with scales at the sides and above; frons with a horseshoe-shaped prominence, of which the edges are raised, frons covered with dense hairs; eyes naked, large, round; antennae curved, short, about half of costa, bipectinated in ♂, ciliated in ♀; branches about three times shaft and gradually getting shorter towards tip; the branches at tips somewhat spatulated, especially the middle ones and all tips rounded; branches covered at tip and on all sides with some rather long hairs; a short tuft of hairs at front of first joint of shaft; fore tibia with a slightly curved process, a little longer than tibia and roundly pointed; mid tibia with two spurs, longest about as long as first tarsal joint, outer one about $\frac{1}{3}$ rd shorter; hind tibia with four spurs of same proportions; all spurs well covered with scales, except at the tips which are well pointed; all tarsi with a number of spines on inner side; all legs moderately covered with hairs. Fore wing rather broad; costa arched; apex acute; termen somewhat oblique; inner margin straight; $1b$ well forked at base; 2 from $\frac{2}{3}$ rd lower median; 3 from beyond middle of 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are rather erect below and rather oblique above 5; 6 from areole near upper angle; areole rather narrow and long; 7 and stalk of 8, 9, 10 from end of areole, but a little apart; 9 from $\frac{2}{3}$ th of 8; 10 from middle of 8; 11 from upper median at about $\frac{2}{3}$ th; 12 parallel to costa. Hind wing semi-circular; costa well arched; apex rounded; termen rounded, slightly lobed at vein 3; tornus rounded and somewhat lobed at $1a$; $1a$ and $1b$ slightly curved; 2 from beyond middle of lower median; 3 from $\frac{2}{3}$ th to 4; 4 from lower angle; 5 from just above middle of discocellulars, which are very oblique; 6 and 7

stalked for $\frac{1}{3}$ rd of 6; 7 curved upwards at base, then curved downwards and approximated to upper median, which is curved upwards at middle for more than middle third, then oblique to costa near apex; a bar between them at $\frac{1}{3}$ rd of vein 8.

Only one species is known in this genus.

My specimens show a little difference from what Hampson gives in the description; the palpi are there porrect; apex of fore wing produced, 3 and 4 from angle of cell, and in the hind wing 5 is said to be from middle of discocellulars. The first and last differences are of a rather undefined nature without a figure and the others may be variable. In my three specimens the palpi are somewhat upturned; as is suggested by the curve of the first joint and vein 3 is well remote from 4, the origin of vein 5 of hind wing is from just a little above middle. As all the other characters agree well, I have no doubt that my specimens have to come in this genus.

NOTOXANTHA SESAMIODES.

(Pl. V, fig. 18; Pl. IX, figs. 10-17.)

Notoxantha sesamiodes Hmps. *A.M.N.H.* 8. v. p. 485 (1910).

My specimens show slight differences: the dorsal surface of the abdomen of my ♀ is bright yellow, the thorax has a distinct brown patch, which is also present in the ♂s but more or less covered with the pinkish hairs of the patagia; in two of my specimens vein 7 is also streaked with yellowish-white. I have, however, no doubt that my identification is correct, as these differences are only additions and all other points agree in every respect, also the species is very distinctly marked.

My specimens are from Umtali, two ♂s, 3 and 11. 1. '18 (Janse); one ♀ from Salisbury, 11. 12. '16 (Father O'Neil).

Genus CRAMBOMETRA.

(Pl. V, fig. 19; Pl. IX, figs. 18-23.)

Crambometra Prout. *Nov. Zool.* xxxii. p. 376 (1915).

Type *derelecta*.

Proboscis well developed; palpi obliquely upturned, reaching well above vertex of head; first joint a little shorter than second joint, curved; second joint straight, cylindrical; third joint sub-globular, as long as second joint is thick; second joint in front triangularly covered with scales and long hairs; first and third joints with hairs only; vertex smoothly covered with long scales, rounded; eyes very large, round, naked; antennae with the shaft till middle of costa, bipectinated with long irregularly curved branches as long as about 12 times thickness of shaft; branches ciliated in front and ending in rather long cilia; first joint of shaft scaled and without tuft; fore tibia with a thin curved process, a little longer than tibia; first tarsal joint nearly as long as tibia; mid tibia very slender and with two spurs; hind legs rather slender and with four spurs; longest spur about $\frac{1}{4}$ th of tibia, inner spur about $\frac{2}{3}$ rd of outer spur; the spurs have two terminal ridges of teeth, between which is a rounded groove; all legs and the spurs covered with appressed scales and short hairs; inner side of tarsi with spines as well. Fore wing rather long, sub-triangular; costa straight, well rounded towards apex; apex rounded; termen very obliquely curved; tornus somewhat rounded; inner margin nearly straight; *1b* without a fork at base; 2 from beyond $\frac{2}{3}$ rd lower median; 3 from $\frac{1}{4}$ th 2 to 4; 4 from lower angle; 5 from just below middle of discocellulars, which are a little incurved at middle; 6

from upper angle; 7 and 8, 9 and 10 stalked; 8 and 9 anastomosing for some distance, beginning at $\frac{1}{3}$ rd origin of stalk 7, 8 to apex, in order to form a rather long areole; 7 from before end of areole; 10 from areole a little before 7; stalk of 9, 10 from upper median at about $\frac{5}{8}$ th; 11 from upper median at about $\frac{1}{3}$ rd, curved; 12 parallel to costa. Hind wing large, triangular; costa nearly straight; apex well rounded; termen very oblique and very much curved; tornus rounded, somewhat lobed at $1b$; inner margin very much excurved at $1a$, and somewhat incurved between $1a$ and $1b$; $1a$ moderate, straight; $1b$ long, straight; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{4}{5}$ th 2 to 4; 4 from lower angle; 5 very faint, from middle of discocellulars which are also faint, slightly oblique outwardly; 6 from upper angle; 7 from upper median at $\frac{3}{8}$ th; 8 curved upwards from base, then downwards to about middle of upper median, which it nearly touches, then curved upwards to costa.

CRAMBOMETRA DERELICTA.

(Pl. XIV, fig. 12; Pl. V, fig. 19; Pl. IX, figs. 18-23.)

Crambometra derelicta Prout. *Nov. Zool.* xxii. p. 376 (1915).

♂. Head, palpi, shaft of antennae, thorax, abdomen, legs, and fore wing cream colour (xvi); some scales on the palpi, irroration of fore legs, branches of antennae and a patch on vertex of head fuscous (xlvi); fore wing sparsely irrorated with fuscous-black (xlvi) dots, more densely at medial and sub-medial folds so as to indicate two fascia; cilia white, with some fuscous-black scales at end of veins; hind wing white, without any markings except a few black scales here and there; cilia white with fuscous-black scales at end of veins, except at veins $1a$ and 5. Under side of fore wing whitish, suffused with avellaneous (xl) and sprinkled with fuscous dots on costal and terminal area; hind wing white, except costal area, which is suffused with avellaneous and sprinkled with fuscous spots; cilia of both wings white with black scales on end of veins.

Exp. 37 mm.

Tongaat (Natal), collected by B. C. Burnup; I have two ♂s, one in very bad condition.

Genus CAMPYLOCTYS nov.

(Pl. V, fig. 20; Pl. X, figs. 1-7.)

Type *gladstonei*.

♂. Proboscis well developed; palpi porrect, covered with hairs and some scales, evenly fringed with hairs and some scales mixed in front; first joint short; second slender, cylindrical, about two times first joint; third joint very small, less than half of first, pear-shaped; frons flat and tufted with rather long hairs; eyes very large and round, smooth; antennae about half of costa, bipectinated till tip; pectinations about 8 times shaft, very much curved towards tip, often irregularly arranged and with rather long cilia in front; first joint of shaft without a tuft; legs rather long and slender, covered with appressed scales and not fringed with hairs; fore tibia with a process nearly reaching end of tibia and curved towards the outside, fringed with long hairs on inner side; mid tibia with two spurs, hind tibia with four spurs; terminal spurs moderate, mid spurs about as long as first tarsal joint; spurs covered with scales and hairs and ending in an almost straight point which has two long rows of teeth; tarsal joints of fore legs very long, nearly two times tibia, first joint very long, joints in mid legs about as long as tibia, in hind legs shorter. Fore

wing rather broad; costa well arched; apex bluntly rounded; termen oblique, nearly straight, slightly incurved between veins 4 and 6; tornus well rounded; inner margin somewhat curved; *1b* straight, apparently forked at base; 2 from beyond $\frac{3}{4}$ rd lower median; 3 from near, 4 from lower angle; 5 from just above middle of discocellulars, which are almost straight, somewhat oblique outwardly; 6 from upper angle; 7 and 8 stalked for nearly half length of 7 and from upper median well before angle; 9 and 10 stalked for about middle of 10, and from upper median at same distance as stalk of 7-8 to 6; 11 from upper median at $\frac{3}{4}$ rd and somewhat curved; 12 parallel to upper median and vein 11, ending at a little beyond middle of costa and thus rather short. Hind wing very broad; costa somewhat incurved; apex well rounded; termen very oblique, straight from 7 to a little beyond 4, then roundly lobed at 3, then straight to tornus, which is sharply rounded at *1b*, then roundly curved at *1a*, then straight; *1a* rather short, straight; *1b* long, somewhat curved; 2 from $\frac{3}{4}$ rd lower median; 3 from $\frac{1}{4}$ th distance 2 to 4; 4 from lower angle; 5 almost absent from middle of discocellulars, which are parallel to termen and well curved; 6 from lower angle; 7 from upper median and from well before the angle; 8 much curved to $\frac{1}{3}$ rd upper median and parallel to this vein for $\frac{3}{4}$ rd, then suddenly upcurved towards costa and curved downwards again towards near apex.

This genus comes near *Crambometra* from which it may have developed and from which it differs in the palpi being porrect, fore wing with termen less oblique, no areole being formed, 5 from above middle of discocellulars and process of fore leg being shorter. There is a remarkable resemblance in the antennae of those two genera, though in *Crambometra* the branches are a little longer. As the areole of the fore wing in *Crambometra* is formed by the anastomosing of the stalked 7, 8 and 9, 10, it is quite possible, that when more species are discovered, *Campyloctys* will prove to have sub-generic value only.

CAMPYLOCTYS GLADSTONEI spec. nov.

(Pl. XIV, fig. 13; Pl. V, fig. 20; Pl. X, figs. 1-7.)

♂. Head, palpi, thorax, legs and ground colour of fore wings pinkish-buff (xxix), irrorated more or less thickly with fuscous (xlv) and fore wing suffused with cinnamon-buff (xxix); fore wing with an indistinct antemedial line of fuscous-black (xlv) irroration, much curved outwards at middle, then angled inwards to lower median, then angled outwards to irroration on plical fold, angled inwards again to *1b* and outwardly oblique to inner margin; a fuscous-black dense irroration beyond antemedial line in cell and beyond cell as a streaky suffusion between the veins 4 to 10 which retain the ground colour; another suffused irroration between lower median and plical fold, getting fainter towards termen; an ill-defined fuscous-black spot on vein 6 at middle; a series of ill-defined sub-terminal fuscous-black spots on the veins, parallel to termen; better defined terminal fuscous-black spots between the veins from above plical fold to apex; a fuscous-black irroration on costa at base, along apex and on inner margin towards tornus; cilia cinnamon-buff with black points at end of veins and plical fold. Hind wing shiny transparent white, suffused with ivory yellow (xxx); cilia like colour of wing with fuscous-black points on the end of the veins. Under side of fore wing with ground colour as above, but evenly suffused and irrorated with avellaneous (xl) and fuscous, especially along costa; hind wing and cilia of both wings as on upper side. Abdomen above and on under side cartridge-buff (xxx); antennae with shaft sayal-brown (xxix); branches fuscous.

Exp. 41 mm.

Hab. Capetown, May 1912. Two ♂ specimens, one in Transvaal Museum and one in my own collection. Both specimens were collected amongst many other moths by Lord Gladstone, who kindly presented these to the Transvaal Museum.

The type specimen shows a peculiar abnormality in the left fore wing, where vein 6 sends a long branch or bar to the free part of vein 7 so as to connect these two veins and form a big areole between vein 6 and stalk of 7, 8; the other wing is normal, however.

Genus ZANA.

(Pl. V, figs. 21, 22; Pl. IX, figs. 24-29.)

Zana Wlk. *Cat.* VII. p. 1700 (1855).

Hmps. *Moths of India*, I. p. 144.

Eutimia Wllgrn. *Öfv. Vet. Akad. Förh.* XV. p. 211 (1859).

Type *lignosa* Wlk. Description made of *marpissa*.

♂, ♀. Proboscis rather short; palpi short, hardly reaching frons, porrect; first joint slightly longer than second joint; third joint almost globular and with a dent on upper tip; first and second joints with long hairs in front; eyes elliptical, longer than palpi, naked; antennae about half of costa, bipectinated, shaft gradually becoming dentate towards tip; branches about three times shaft, ciliated anteriorly and at ends; a short hair-tuft on first joint of shaft; fore tibia with long hair and a flat process, slightly longer than tibia in both sexes; the process is flat, somewhat curved and slightly overlapping the fibia on the inner side (though hollow, it does not appear to be keel-shaped as in *Antheua*); mid leg with two, hind leg with four moderate spurs, the points of which are curved inwards and each has two ridges with a slight depression between them; mid and hind femurs moderately covered with long hairs, tibiae with still less hairs; tarsi of all legs with spines on inner side and further covered with hairs. Fore wing broad, sub-triangular; costa nearly straight; outer margin somewhat oblique, well rounded and sinuate; apex, tornus and inner margin well rounded; 1a faint, as a branch of fork of 1b; lower median curved upwards; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, rather weak; discocellulars erect, somewhat rounded; 6 from upper angle or from well beyond it and then from areole (in some specimens of *Z. anodonta* 6 comes from middle, $\frac{2}{3}$ th, or even end of areole); areole rather long, nearly as long as half of 10; 7 from, from just before, or from slightly beyond end of areole; 8 and 9 on a stalk of half free part of 8 and from end of areole; 10 from before or from end of areole; 11 from upper median at $\frac{2}{3}$ rd; 12 parallel to costa. Hind wing semicircular; costa well arched; termen very oblique and well rounded, somewhat sinuate; apex rounded; tornus much rounded; outer margin rounded; 1a and 1b nearly straight; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 rather weak and from middle of discocellulars which are erect and somewhat curved; 6 and 7 on a stalk of $\frac{1}{4}$ th of 7; 8 parallel to upper median for nearly whole length and with an indication of a bar at $\frac{1}{3}$ rd (in *anodonta* no bar is visible). The mesothorax has an indication of a small crest and the abdomen is marked as a typical *Antheua*, in fact it is rather difficult to separate this genus from *Antheua*; in *Zana* too the venation of veins 6 to 10 is very variable. In *Zana* the outer margins are certainly more crenulate, but in *Antheua* they are not quite entire as stated by some writers; the palpi are shorter and distinctly porrect; the spurs have two ridges of teeth on the tip, while in *Antheua* no teeth can be seen in any of its species I placed there; the palpi have the first

joint longer than the second, which is not the case in *Antheua*, though in *encausta* they appear to be equal in length, and the peculiar dent on the third joint I have only observed in *marpissa* and *anodonta*. I therefore think that this genus is sufficiently distinct, though it has great similarity to *Antheua*, of which it may be a parallel development.

Only two species are found in this genus from South Africa, which may be separated as follows:

- 1 a.** Fore wing with a black line on *rb*; oblique terminal grey area bordered by a dark ill-defined line, beginning at termen below vein 7; black scaling in cell; never a black dentate terminal line; female with the hind wing tinged with buffy-brown **marpissa**
- b.** Fore wing without black line on *rb*; oblique terminal grey area bordered by a sharply defined black line, beginning at termen above vein 7; no black scaling in cell; usually a black terminal dentate line, sometimes only indicated at tornus; hind wing of female white. **anodonta**

ZANA MARPISSA.

(Pl. V, fig. 21; Pl. IX, figs. 24-29.)

Eutimia marpissa Willgrn. *Öfv. Vet. Akad. Förh.* xv. p. 211 (1860).

Antheua spurcata Wlk. *Cat.* xxxi. p. 298 (1864).

Dist. *Ins. Transv.* iv. p. 92, Pl. VIII, fig. 10.

I have ♂s and ♀s of this species from Pretoria, Waterval onder, White River; Three Sisters; Barberton (Transvaal); New Hanover (Natal); Melmoth (Zululand); in Jan., March, Oct., Nov., Dec.

Larva feeds on grass (E. E. Platt).

ZANA ANODONTA.

(Pl. V, fig. 22.)

Zana anodonta Hmspn. *A.M.N.H.* 8. v. p. 476 (1910).

I have ♂s and ♀s of this species from Waterval onder, White River, Karkloof, Eshowe; in Jan., Febr., March, Nov., Dec.

Genus RAMESA.

(Pl. V, fig. 23; Pl. X, figs. 8-11.)

Ramesa Wlk. *Cat.* v. p. 1016 (1855).

Hmspn. *Moths of India*, I. p. 142.

Type *tosta* Wlk. Description from *macrodonta*.

♀. Head rather broad; proboscis present, rather short; palpi obliquely upturned, longer than length of eyes, covered with hair on under side, with scales at sides, three jointed; eyes moderately glabrous, rounded in front and less curved posteriorly; antennae nearly half of costa, serrate on inner side only for about half the length of shaft with long narrow teeth, on outer side with very short teeth; beyond middle of shaft the serrae become gradually shorter towards tip; outer serrae terminally with short hairs; base of shaft with a tuft of hair; legs covered with rather long hair; mid tibia with two rather long spurs, outer one longest; hind tibia with four spurs, inner ones about $\frac{2}{3}$ rd of outer spurs, median spurs longer than terminal spurs. Fore wing sub-triangular;

costa arched; termen oblique and well rounded; inner margin gently arched; apex sub-acute; tornus well rounded; $1b$ forked; 2 from near lower angle; 3 from middle distance 2 to 4; 4 from lower angle; 5 from middle of discocellulars which are erect; a forked veinlet in the cell; 6 from upper angle; areole present, long, over $\frac{2}{3}$ rd of vein 6 in length, narrow; 7 and stalk of 8, 9 from end of areole; 8 and 9 on a stalk of half of 8; 10 from areole at $\frac{1}{4}$ th the areole; 11 from upper median at beyond middle; 12 free. Hind wing triangular; costa slightly incurved at middle; termen roundly and slightly lobed between 2 and 6; inner margin curved; apex roundly produced; tornus well rounded; 2 from $\frac{2}{3}$ rd lower median; 3 and 4 from lower angle; 5 from middle of discocellulars; 6 and 7 stalked for about $\frac{1}{3}$ th of 6 and from upper angle; 8 curved upwards near base, then approximated to upper median at middle, then remote.

Species belonging to this genus are recorded from India and Africa; two species have so far been described from South Africa and may be separated as follows:

1 a. Areole moderate; vertex of head yellowish white; no antemedial line; medial line waved; a black discoidal bar; cilia whitish; 34 mm.

dasychira

b. Areole long; vertex of head black-brown; antemedial line present, double, very much dentate below lower median; medial line ill defined, brown; discoidal bar brown, defined by black; cilia brown; 40-50 mm. **macrodonta**

RAMESA MACRODONTA.

(Pl. V, fig. 23; Pl. X, figs. 8-11.)

Ramesa macrodonta Hmps. *Trans. Zool. Soc.* XIX. p. 119, Pl. IV, fig. 38 (1909).

Hab. Uganda; Sierra Leone; S. Rhodesia (Sebakwe).

Through the courtesy of Dr L. Péringuey, I have seen two ♀s of this species, both from Sebakwe, collected by D. Dods in Jan. 1902 and in 1901. One of these was kindly presented to my collection by the Director. So far only ♀s are known from South Africa and as the specimens were minus front legs, I could not study these. The antennae of the ♀s are not quite bipectinated, as Sir George Hampson states, but rather unipectinated, the outer branch being reduced to a mere lobe or tooth, as shown in the illustration. The hind wing also does not show a bar between vein 8 and upper median as given in *Moths of India*, vol. 1. fig. 85, and veins 3 and 4 are from a point in my specimen, not remote. The figure given of this species is not very representative, unless the ♂ differs very much from the ♀, which is not stated in the description, however.

Spec. auct.: *Ramesa dasychira* Hmps. *A.M.N.H.* 6. v. p. 484 (1910).

Hab. Transvaal (White River).

Genus POLIENUS.

(Pl. X, figs. 12-17.)

Polienus Dist. *Ins. Transv.* IV. p. 93 (1899).

Type *modestus*.

♂, ♀. Proboscis absent; head rather small, bent downwards; eyes naked, rounded, rather large; palpi three jointed, somewhat upturned; first joint somewhat curved; second joint nearly two times first joint; third joint very small, pointed; all joints covered with long hairs; antennae of ♂ bipectinated

to tip; branches gradually getting shorter; pecten about four times shaft and with fine cilia exteriorly; shaft about half of costa, first joint sub-globular and with a tuft of hairs in front; in ♀ antennae half of costa, simple, ciliated; legs covered with hairs only (except in *fuscata*, where there are also some scales), on femurs very long; fore tibia with a broad, somewhat pointed process hidden in dense hairs; mid tibia with two rather long pointed spurs, which are covered with short hairs, outer spurs shorter than inner ones; hind tibia with 4 long pointed spurs covered with short hairs and of which the outer ones are the shortest; tarsi with hairs and scales; a pointed tuft of hairs on mesothorax. Fore wing rather broad; costa and inner margin nearly parallel; costa straight, rounded towards apex; apex sub-acute; outer margin somewhat oblique, rounded between veins 2 to 6; tornus rounded; inner margin straight; *1b* faintly forked at base, curved at $\frac{1}{3}$ rd, then straight; 2 from beyond $\frac{3}{4}$ th lower median; 3 from middle of distance 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are erect, somewhat rounded above and below vein 5; 6 from just below upper angle; 7 from upper angle and connected by a short bar at $\frac{1}{3}$ th of 7 with stalk of 8, 9, 10 to form a moderate areole, about four times as long as broad; 8 stalked with 9 and 10; 9 from $\frac{2}{3}$ rd, 10 from $\frac{1}{3}$ rd the distance from end of areole to apex; 11 from $\frac{2}{3}$ rd upper median; 12 parallel to costa. Hind wing semi-circular; costa excurved at $\frac{1}{3}$ rd, somewhat incurved at $\frac{2}{3}$ rd; apex well rounded; outer margin very oblique, well curved, shortly lobed at 3; tornus well rounded; inner margin well curved; *1a* nearly straight; *1b* curved; 2 from well beyond middle of lower median; 3 from well beyond middle of distance 2 to 4; 4 from lower angle; 5 straight, rather faint and from middle of discocellulars, which are very oblique from 4 to 5, erect from 5 to upper angle; 6 and 7 stalked for nearly $\frac{1}{3}$ rd of 6 and from upper angle; upper median well curved at terminal half; 8 curved upwards at base and approximated to upper median at middle of cell and connected to it at beyond $\frac{1}{3}$ rd by a bar.

The description given by Distant is in several respects both vague and inaccurate, I think. The porrect position of the palpi is, I think, due to the downward position of the head, as the curve of the first joint indicates a more upturned position; the antennae of the male are *clearly* bipectinated, not *obscurely* as stated; no mention is made of an areole and the other characters given have little generic value; no spurs are mentioned, which are conspicuous; the figure is evidently that of a ♀.

Species in South Africa:

- | | | | |
|------|--|-------------------|---|
| 1 a. | Hind wing white in ♂ | modestus | |
| b. | Hind wing fuscous in ♂ (probably also in ♀) | | 2 |
| 2 a. | Fore wing with an oblique fascia from apex to near vein 5; a second fascia, nearly parallel to first, from vein 5 near outer margin to vein 3; a terminal series of black spots between veins <i>1b</i> -7 | fuscata | |
| b. | No oblique fascia on fore wing and no terminal black spots; a dark diffused fascia above lower median and vein 4; 6 slightly stalked with areole; areole longer than in <i>modestus</i> | nigrosarsa | |

POLIENUS MODESTUS.

(Pl. X, figs. 12-17.)

Polienus modestus Dist. *Ins. Transv.* iv. p. 94, fig. 10 (1899).

Most of my ♀s have white hind wings, but one specimen from Umtali has the terminal half tinted with hair-brown.

I have this species from Pretoria, Bultfontein, Rustenburg, Waterval onder, Barberton (Transvaal); Karkloof, Sarnia,-Umkomaas (Natal); Umtali S. Rhodesia); in Jan., Febr., March, Nov.

POLIENUS FUSCATA spec. nov.

(Pl. XIV, fig. 15.)

♂. Thorax, base of abdomen, antennae, ground colour of wings on upper side cream colour (xvi); head covered with cream coloured, ochraceous-tawny (xv) and black hairs mixed; pectinations of antennae and palpi at sides cream-buff (xxx), the latter mixed with fuscous (xlvi) hairs and towards head with fuscous hairs only; sides of face, frons, hairs of femora and tibiae fuscous, very dense on front legs, less dense on the other legs; remainder of legs and hairs of abdomen on under side cream colour; hairs of thorax above mixed with some whitish and ochraceous-tawny hairs and with a distinct median patch on meso- and metathorax of ochraceous-tawny hair, forming a tuft in front; abdomen irrorated with hair-brown (xlvi) scales. Fore wing with costa thickly and median area moderately irrorated with black; a black point on lower median at sub-basal area and at $\frac{2}{3}$ rd; an oblique patch shaded with cinereous (lii) on inner margin from sub-basal to medial lines; this shading like the remainder of the fore wing is irrorated with black and fuscous scales; an indication of a medial and a postmedial blackish line; medial area except at costal and inner marginal area thickly irrorated with ochraceous-tawny, connected with two oblique fascia of the same colour and which go upwards towards termen; first fascia from vein 3 at $\frac{1}{3}$ rd to vein 4 at beyond $\frac{2}{3}$ rd; second fascia from above vein 5 to apex; both fascia are irrorated with black scales; a series of black, small, sub-terminal spots between the veins from above 1*b* to below vein 7; cilia of ground colour and with some black scales here and there and gradually getting lighter towards tip. Hind wing thickly irrorated with fuscous except at base, and near inner margin; cilia of ground colour except at base, which is fuscous.

Under side: fore wing with costa cream-buff, irrorated with black scales; ground colour of both wings and cilia cartridge-buff (xxx); both wings, except outer margins, irrorated with fuscous; cilia with a fine basal fuscous line.

Exp. 38 mm.

Hab. ♂ type from Umtali, 12. 1. '18; ♂ cotype, Umtali, 7. 1. '18 (Janse).

POLIENUS NIGROPARSA spec. nov.

(Pl. XIV, fig. 14.)

♂. Vertex of head and shaft of antennae isabella colour (xxx), the former mixed with some black hairs, the latter ringed with black; thorax on upper side and base of fore wing below lower median whitish; a median honey-yellow (xxx) patch, beginning as a small tuft on meso- and metathorax; abdomen on upper side with long hair-brown (xlvi) hairs except last segments which become gradually cream coloured (xvi); palpi in front, thorax and abdomen on under side and hairs on legs cream coloured; hairs on prothorax and fore femurs and inner side of palpi hair-brown and fuscous; pectinations of antennae honey-yellow. Fore wing on upper side of cream colour (xvi) thinly speckled with black scales; veins and a triangular patch below lower median from base of vein 2 to near base of inner margin, cartridge-buff (xxx); some dark irroration, forming faint fasciae above lower median and vein 4, and from fork of 1*b* obliquely to inner marginal fold; cilia cartridge-buff with some fuscous and hair-brown scales at base.

Under side: ground colour of both wings cartridge-buff to white; fore wing with the costa cream coloured and with some black scales; a black fascia from upper median and vein 10 to vein 12, gradually becoming fuscous terminally;

remainder of fore wing, except the base and terminal area thickly irrorated with hair-brown; some black scales at terminal area and on cilia; hind wing thinly irrorated with hair-brown scales, most thickly at terminal half between veins 3 and 6; some black scales here and there and on the cilia.

Exp. 41 mm.

Hab. Victoria Falls (S. Rhodesia), 26. 1. '18 (Janse). Only one specimen.

This species has vein 6 of fore wing coming from the areole near base, but is otherwise typical.

Genus PRIONOCENTRUM nov.

(Pl. X, figs. 18-22; Pl. XI, fig. 1.)

Type *o'neili*.

♂, ♀. Proboscis absent; palpi upturned, reaching vertex of head, third joint obliquely porrect; first joint short, curved; second joint over two times first joint; third joint shorter than first; all joints with short hairs in front; first and second joints covered with scales; eyes large, rounded, naked; frons with dense, rather long hairs; antennae of ♂ a little over half of costa, curved, bipectinated till near tip; branches about 8 times shaft and densely ciliated all round; first joint with a tuft of hairs in front; antennae of ♀ less than half of costa, bipectinated till near tip, branches on inner side as long as breadth of shaft, inner branches two times; fore tibia of ♂ with slightly curved process, which is a little longer than the tibia; femora and tibiae moderately fringed with long hairs; first tarsal joints fringed with long hairs, other joints with moderate hairs; mid tibia with two spurs, hind tibia with four spurs, inner spur a little shorter than outer; spurs provided on apical half with two rows of teeth, which come together at the point, which is nearly straight; between the rows is a rounded groove; spurs covered with some hairs and scales; tarsi with some spines on inner side. Fore wing broad triangular and somewhat produced at apex; costa slightly hollow, well curved towards apex; apex nearly acute; termen somewhat oblique and a little incurved below apex, then straight to vein 3, then well rounded at tornus; inner margin a little curved before middle; in ♀ the costa is slightly curved and the outer margin less incurved below apex; 1*b* very indistinctly forked at base; 2 from just beyond $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from just above middle of discocellulars which are oblique towards apex on upper part and has indications of veinlets in the cell; 6 from areole, which is long and narrow; 8, 9, 10 stalked and from end of areole; 9 from before $\frac{2}{3}$ rd; 10 from $\frac{1}{3}$ rd of 8 beyond end of areole to apex; 11 from $\frac{2}{3}$ rd upper median; 12 parallel to costa. Hind wing triangular; costa slightly incurved; apex well rounded; termen oblique and very much rounded between 2 and 7 and somewhat incurved between 1*b* and 2; tornus rounded; inner margin nearly straight, oblique; 1*a* very long, straight; 1*b* straight; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{3}{4}$ th 2 to 4; 4 from lower angle; 5 from just above middle of discocellulars, which are erect and evenly curved; 6 and 7 very slightly stalked and from upper angle; 8 upcurved near base, then downcurved and touching upper median before middle, but not anastomosing with it, then curved upwards and parallel to costa.

PRIONOCENTRUM O'NEILI.

(Pl. XIV, fig. 16; Pl. X, figs. 18-22; Pl. XI, fig. 1.)

♂. Ground colour of fore wing, irroration of hind wing, shaft and branches of antennae, fore legs in front, and patagia partly cinnamon-rufous (xiv); palpi in front cream colour (xvi) posteriorly fuscous (xlv); frons and vertex

of head warm buff (xv) well mixed before and between the antennae with flame scarlet (ii) hairs; patagia and tegulae of ground colour, but across the patagia a broad transverse line of flame scarlet and a patch of the same colour between the tegulae on meso- and metathorax; abdomen above of ground colour, except at base and apex, where cream coloured hairs predominate. Fore wing uniformly and finely dusted with cinnamon-rufous; an indistinct light coloured patch at base below lower median; an antemedial irregular pale orange-yellow (iii) line from below costa to $1b$, outwardly oblique from below costa to middle of cell, then angled inwardly to lower median where it is interrupted, to start again below lower median a little nearer to base than the beginning of the line and almost erect to $1b$, forming a tooth-like projection in middle; the antemedial line has a dark shading here and there on inner side; an indistinct light coloured line on discocellulars; a broad postmedial strigulated band, beginning at costa and erect till vein 4, then inwardly oblique to inner margin; the strigulae are pale orange-yellow, arranged in 5 parallel rows; curved between the veins and interrupted on the veins; on the outer side this band has a dark diffused line, dentated on the veins; some dark terminal shading from apex till along tornus; an ill-defined oblique fascia, slightly darker than ground colour, from apex to postmedial band at vein 4; cilia of ground colour. Hind wing with the ground colour pale orange-yellow, thinly irrorated at basal half and tinged at terminal half with cinnamon-rufous; cilia cinnamon-rufous at base, tipped with whitish.

Under side: thorax, fore legs on inner side, whole of mid and hind legs and ground colour of abdomen pure white; white hairs of abdomen mixed with pale orange-yellow hairs; fore wing with the ground colour cinnamon-rufous except along costa and at basal area, which are cream-buff (xxx), remainder of wing thickly irrorated with cream-buff; hind wing white, thickly irrorated at terminal half with cinnamon-rufous. *

♀. Ground colour somewhat lighter; patches on head, patagia and thorax less defined and ochraceous-buff (xv); antemedial area from costa to $1b$ deep chrome (iii) including the antemedial line, and well irrorated with cinnamon-rufous; postmedial band deep chrome; strigulae ill defined; area beyond postmedial band deep chrome, densely sprinkled with cinnamon-rufous; oblique apical fascia broader and darker; hind wing somewhat lighter; under side, hairs of legs, thorax and abdomen onion-skin pink (xxviii); ground colour of fore wing and hind wing pale yellow-orange (iii); fore wing irrorated, very densely at terminal half with testaceous (xxviii); hind wing rather thickly irrorated with testaceous on costal and terminal areas.

The intensity of coloration seems to vary considerably in the ♂; one of my ♂ specimens is very lightly coloured and has the antemedial markings diffused, and of a deep chrome colour, while the postmedial band is also deep chrome in ground colour and has the strigulae even more diffused than in the ♀; in another ♂ the antemedial markings are broader and lighter, while the strigulae of the postmedial band are very narrow and often wanting.

Exp. ♂ type, 59 mm.; ♀ type, 68 mm.; another worn ♀ is 75 mm.

Hab. Five ♂s and two ♀s all from S. Rhodesia, Umvuma and Salisbury, collected by Mrs Carnegie, Father O'Neil and myself in Nov., Dec., Jan., March.

Father O'Neil informs me, that the caterpillar is green and feeds on *Brachy-
spegia randii*.

Genus PYDNA.

(Pl. XI, figs. 2-8.)

Pydna Wlk. *Cat.* VII. p. 1753 (1855).Hmps. *Moths of India*, vol. I. p. 138 (1892).Type *testacea* Wlk. Description from *rubritincta*.

♂, ♀. Proboscis rudimentary; palpi upturned, reaching above vertex of head; first joint rather short, curved; second joint about two times first joint, nearly straight; third joint small, about half of first joint, somewhat pointed; all joints covered with hairs and scales in front, with hairs at sides and above; eyes large, suboval, smooth; antennae over half of costa, bipectinated in ♂, simple in ♀; pectination about three times shaft, gradually getting shorter towards tip, pecten ciliated at tip and on anterior side; first joint of shaft with hairs and scales in front, forming a short tuft; fore tibia with a process shorter than tibia, somewhat broad at middle and roundly pointed towards tip; femurs of fore leg moderately covered with hairs and scales; mid tibia with two spurs, longest about half the length of the tibia, outer spur about $\frac{1}{3}$ rd shorter; hind tibia with four long spurs, shortest about $\frac{1}{3}$ rd of tibia and on the outer side, inner spurs about half as long; all spurs acuminate terminally and covered with hairs and scales; femora and tibiae of all legs covered with hairs and scales; tarsi with scales and some spines on inner side. Fore wing rather broad; costa somewhat arched; apex rather acute; termen nearly erect, rounded from vein 4; tornus well rounded; inner margin nearly straight; 1*b* indistinctly forked at base; 2 from about $\frac{3}{4}$ th lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from middle of discocellulars, which are oblique outwardly; 6 from upper angle of cell; 7, 8, 9, 10 stalked¹, and from well before upper angle; 7 from about half of 10; stalk of 8, 9 from $\frac{3}{4}$ th of 10; 9 very short, from beyond free half of 8; 11 from about $\frac{3}{4}$ th upper median; 12 parallel to costa. Hind wing sub-triangular; costa curved; apex, outer margin, tornus and inner margin well rounded; 1*a* and 1*b* nearly straight; a small rounded lobe at 1*b*; 2 from $\frac{2}{3}$ rd lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 rather weak and from middle of discocellulars which are oblique outwardly; 6 and 7 stalked for over $\frac{1}{3}$ rd of 6 and from upper angle; 8 upcurved from base, then downcurved to upper median at beyond half, before half of upper median traces of an oblique bar, then curved upwards to costa and ending near apex.

The absence of the areole in *P. rubritincta* must be considered as an exception in this genus, caused by the two long sides of the areole having become anastomosed and this species should thus be regarded as the most highly developed species in the genus; it is further peculiar that vein 10 is given off beyond the areole, which is the case in the Indian and African species when the areole is short; in the Indian and African species that have the areole long vein 10 is said to come from the areole.

¹ In *P. rubrifascia* an areole is present, which is very long, over half of vein 10, and narrow; 6 comes from areole near base; 7 from just before end of areole; 8, 9, 10 stalked from end of areole; 9 from 8 at beyond half the distance end of areole to outer margin; 10 slightly stalked with 8, 9.

In *P. flavida*, which is unknown to me from specimens, the areole is said to be present also, but it is short and 10 comes from beyond the areole.

Only three species have been recorded from South Africa so far, which may be distinguished as follows:

- 1 a. Fore wing with a rust-brown fascia below lower median reaching till near termen below vein 6; areole long and narrow, vein 6 from areole at base **rubrifascia**
- b. No rust-brown fascia in fore wing, areole short or absent **2**
- 2 a. Areole absent; 7, 8, 9, 10 stalked; fore wing yellowish-brown; hind wing irrorated with fuscous **rubritincta**
- b. Areole short; 10 from beyond areole; fore wing ochreous-white; hind wing white with some brown irroration in and just beyond the cell **flavida**

PYDNA RUBRIFASCIA.

(Pl. XI, fig. 3.)

Pydna rubrifascia Hmps. *A.M.N.H.* 8. v. p. 486 (1910).

The branches of the antennae of this species are longer than in *rubritincta*, nearly four times.

I have seen one ♂ specimen in the collection of the South African Museum, collected at Salisbury by Dr M. Melle.

PYDNA RUBRITINCTA.

(Pl. XI, figs. 2, 4-8.)

Pydna rubritincta Hmps. *A.M.N.H.* 8. v. p. 485 (1910).

Of this species I have seen a specimen in Mr Clark's collection, which is a duplicate of the specimen sent to Sir George Hampson and identified by him as such. This specimen and my own agree very well with the description except that the postmedian spots go beyond vein 6, right up to the costa; my specimens are only 41 mm., not 44 mm. They come from Zululand (Eshowe, Nkwaleni); Natal (Sarnia) and Transvaal (Barberton); all collected by myself in Dec. and Jan.

The markings of the ♂ are like those of the ♀; the sexes only differ in the antennae.

Spec. auct.: *Pydna flavida* Hmps. *A.M.N.H.* 8. v. p. 485 (1910).

I have not seen specimens of this species, which is recorded from Durban and Charlestown (Natal).

Genus POLELASSOTHYS nov.

(Pl. XII, figs. 2-8.)

Type *plumitarsus*.

♂, ♀. Proboscis very much reduced, almost absent; palpi porrect, short, hardly reaching frons, consisting of two joints only; first joint short, covered with rather long scales and hairs at sides and at front; second joint of about the same length, joined with a neck-like part to the first joint, sub-globular, ending in a sharp point and covered with long scales, mixed with hairs; eyes naked, large, round; frons flat, covered with scales and hairs; antennae of ♂ short, less than half of costa, basal $\frac{3}{4}$ rd curved downwards, apical third upwards; bipectinated from $\frac{3}{4}$ th, pecten about 6 times shaft; first joint of shaft with a tuft of hairs and scales in front; in ♀ the shaft is still shorter, pectinations till $\frac{3}{4}$ rd and about four times shaft; thorax covered with scales mainly, forming a

slight tuft on prothorax and a spreading crest on metathorax; abdomen covered with rather long hairs, last segment with a tuft of long hairs in the ♂; on first segment a spreading crest of scales; femora of all legs thinly covered on inner side with long hairs; all tibiae with long hairs and scales in front, forming tufts; fore tibia with a process a little longer than tibia, forming a fluted organ, narrow at upper $\frac{2}{3}$ rd, then broadening out towards tip, then acuminate; the edges of the process are covered with hairs and the whole is somewhat hidden in the hairs on inner side of the tibia; mid and hind tibiae with two spurs only; outer spur a little longer than the inner one, spurs very sharply pointed, provided with two ridges of teeth for nearly $\frac{2}{3}$ rd their whole length, the ridges converge towards the point and the spurs are for the greater part covered with rather long hairs; tarsi armed with spines and covered with tufts of hairs and scales at each joint, last joint with such a tuft at end between the claws. Fore wing broad, triangular; costa a little arched near base, then straight; apex rounded; termen somewhat oblique, curved, a little produced at veins 4 and 6; tornus very little rounded; inner margin somewhat arched; *1b* forked at base; 2 from $\frac{3}{4}$ th lower median; 3 from $\frac{2}{3}$ rd 2 to 4; 4 from lower angle; 5 from a little above middle of discocellulars, which are oblique outwardly and somewhat curved; 6 from upper angle; 7, 9, 10 stalked; 8 absent; 7 from 9 at before $\frac{2}{3}$ rd; 10 from 7, 9 at a little beyond $\frac{1}{3}$ rd; stalk from a little before upper angle; 11 from beyond $\frac{2}{3}$ rd upper median; 12 parallel to costa. Hind wing semicircular; costa somewhat hollowed out at middle; apex well rounded; termen very oblique, very much arched and somewhat incurved at vein 5; tornus well rounded; inner margin arched; *1a* rather long; *1b* straight; 2 from lower median before $\frac{2}{3}$ rd; 3 from $\frac{3}{4}$ th 2 to 4; 4 from lower angle; 5 rather weak, but present, from just above middle of discocellulars, which are very oblique outwardly, each half being somewhat curved; 6 and 7 on a stalk of over half and from upper angle; 8 free at base, then curved towards and anastomosing with the upper median till near upper angle, then curved upwards and parallel to costa for the greater part. This genus is more reduced than any other Notodontid known to me, especially the absence of the third joint of the palpus is interesting.

POLELASSOTHYS PLUMITARSUS spec. nov.

(Pl. XIV, fig. 17; Pl. XII, figs. 2-8.)

♂. Most hairs and scales of thorax, ground colour of both wings on upper and under side and hairs on legs pure white; scales on head and prothorax and the tuft cinnamon (xxix) mixed with white and black; metathoracic tuft of burnt sienna (ii) scales on outer side and metallic urania-blue (xxiv) scales mixed with white scales; abdomen white, mixed with hair-brown (xlvi) hairs; tuft on abdomen of orange-cinnamon and mikado-brown (xxix) scales; palpi white, tinged with orange-cinnamon towards tip and slightly irrorated with black; shaft of antennae white, irrorated with dark vinaceous-drab (xlv); branches Prout's brown; fore wing densely irrorated beyond sub-basal line, except before antemedial line, between lower median and *1b*, with very fine black points with which each scale is tipped, so as to produce a pale drab-grey (xlvi) colour when viewed without a magnifying glass; the lines are produced by the irroration being a little more dense and by being preceded or followed, or both, by the whitish ground colour; a basal line of fine black irroration in pure white field, almost straight; beyond it, to sub-basal line a narrow edging of such an irroration along the costa; sub-basal of black irroration preceded by almost pure white field and followed by pure white line, oblique from costa

to lower median, then forming a semicircular curve till $1b$, then erect to inner margin; beyond this curved part, well below lower median and well above $1b$, the antemedial area remains pure white, except for a few cinnamon-orange scales here and there; remainder of antemedial area irrorated with black and here and there at costal and inner marginal area with some orange-cinnamon scales, especially at $1b$; antemedial line indistinct, pinkish-cinnamon (xxix) and preceded by patches of black and orange-cinnamon scales mixed, one below costa, two in cell, a small one just below lower median, and a large semilunar patch obliquely above $1b$; the black scales are somewhat raised; median line erect to lower median, then incurved between lower median and inner margin, white, preceded and followed by a rather darker black irroration; beyond it in cell and below lower median, as far as postmedial line, some rather dense light buff (xv) scaling, covering in most part the black irroration; black and orange-cinnamon raised scales on discocellulars; postmedial like medial line, erect, straight from costa to vein 4, forming a tooth outwardly below 4, then curved inwardly below vein 3, then to inner margin long before tornus; most of the terminal area beyond this line, from below costa to vein 5 and narrowly below vein 5 as far as vein 3 the irroration is not black, but orange-cinnamon; some sub-terminal black scaling on veins 6, 7, 9, 10; a crescent mark of black scales on and between 4 and 5 and a few black scales on and between veins $1b$, 2, and just beyond the postmedial line; a dark terminal shading, caused by blacker irroration between the veins; cilia white at base, then with black irroration, and terminally with bunches of large orange-cinnamon scales on the veins, mixed with carob-brown (xiv) and light buff scales between the veins. Hind wing pure white; some fuscous (xlvi) scaling on discocellulars, along costa and from costa a medial scaling of same colour as far as stalk 6, 7 and indistinctly beyond it to inner margin; a terminal fuscous line interrupted on the veins and some fuscous hairs at tornus; cilia white. Under side: ground colour of fore wing white, densely irrorated with fuscous, except at inner marginal area; costal edging as on upper side; a dense fuscous irroration on lower discocellular and a similar terminal fuscous shading between the veins; cilia as above, but no orange-cinnamon scales; hind wing pure white; a fuscous mark on upper $\frac{3}{4}$ rd of discocellulars; medial line very indistinct; terminal line only from veins 4 to 8, gradually becoming indistinct; cilia white with a few fuscous scales around the apex.

♀. Like ♂, but fore wing a little lighter in colour; area between postmedial and sub-terminal from costa to vein 3 paler yellow-orange (iii), less densely irrorated with orange-cinnamon; hind wing with nearly the whole area thinly irrorated with fuscous. Under side as in ♂, except for some white triangular patches between the veins and before the terminal shading from apex to vein 3.

Exp. ♂, 28 mm.; ♀, 35 mm.

Hab. ♂ type from Sawmills (S. Rhodesia), 1. 2. '18 (Janse); ♀ type from Waterberg, Dec. (Jutrenzcka) and another from Waterberg distr. in Oct. 1911 (van Niekerk) in collection Transvaal Museum.

Genus ANAPHE.

(Pl. XI, figs. 9-16; Pl. XII, fig. 1.)

Anaphe Wlk. *Cat.* iv. p. 856 (1855).Wlsh. *Trans. Lin. Soc. Lond.* 2. II. p. 421 (1885).Dist. *Ins. Transv.* iv. p. 89.(Larva) Carl Fromholz. *Berl. entom. Zeits.* Bd. xvii. Heft 1. pp. 9-13 (1883).Butl. *A.M.N.H.* 8. xix. p. 462.*Arctiomorpha* Herr.-Schäff. *Aussereur. Schmett.* 1. p. 11 (1855).*Henosia* Wllgrn. *Kongl. Vet. Akad. Handl.* 2. v. No. 4, p. 51 (1865).Type *reticulata*.

♂, ♀. Proboscis absent; palpi obliquely porrect, just reaching frons, two jointed; second joint about two times first joint, slightly curved and gradually tapering to a point; rather densely clothed with moderate hairs in front; eyes rounded, naked, large; antennae about to middle of costa, bipectinated till tip; branches in ♂ about 5 times shaft, in ♀ about two times; branches ciliated anteriorly and ending in a point which is directed forwardly; first joint of shaft globular and with some moderate hairs in front; fore tibia with a short process which is spirally twisted outwardly and entirely hidden in long dense hairs; mid and hind tibiae with two spurs only, which are moderate in length, covered with hairs and ending in a slightly curved point which has two rows of teeth, as in *Zana*, etc.; mid and hind femora with long hairs on outer side; tibiae with long hairs on inner side; tarsi with appressed hairs and without spines. Fore wing sub-triangular; costa straight; apex rounded; termen oblique and evenly curved; tornus rounded; inner margin straight; 1 *b* straight, indistinctly forked at base; 2 from beyond $\frac{2}{3}$ rd of lower median; 3 from near lower angle, 4 from lower angle; 5 rather weak, from a little above middle of discocellulars, which are almost erect and nearly straight; 6 and stalk of 7, 8, 9, 10 from upper angle; 7 from stalk at $\frac{1}{3}$ rd full length of 7; 9 from 8 at $\frac{2}{3}$ rd origin of 8 to apex; 10 from $\frac{1}{4}$ of stalk 8, 9; 11 from near upper angle; 12 straight, parallel to costa. Hind wing triangular; costa almost straight; apex and tornus well rounded; termen very oblique and well rounded; inner margin slightly curved; 1 *a* straight; 1 *b* somewhat curved; 2 from beyond $\frac{2}{3}$ rd lower median; 3 from near lower angle; 4 from lower angle; 5 weak and from above middle of discocellulars which are outwardly oblique; 6 and 7 on a stalk of nearly $\frac{2}{3}$ rd full length of 7; and from upper angle; 8 curved upwards near base, then approximated to upper median, then oblique to apex, not connected to upper median with a bar; thorax clothed with long hair; abdomen of ♀ ending in a tuft of long loose hairs as found in *Euproctis*, etc.

This is a very peculiar genus, both for structure and for larval habits; the absence of the tongue, the two jointed palpi and the venation of the fore wing are unusual and the abdominal tuft in the ♀ is a character not found in any of the Notodontids dealt with before.

Walker and other writers have placed this genus under the *Lymantriadae*, which is decidedly wrong; on the other hand it shows family characters of the *Striphmopterygidae*, but as clearly shown by Prof. Aurivillius in *Bihang till Kongl. Svensk. Vet. Akad. Handl.* Bd. 27. Abt. iv. No. 7, pp. 3 and 4, the venation of the fore wing is mainly as in the *Notodontidae*, while in the former family vein 10 is either absent or comes at any rate from the stalk farther from the cell than vein 8, while in the Notodontids vein 8 is always farther from the cell than vein 10. It is remarkable, however, that the venation of the fore wing of

reticulata is far from constant. I have three normal specimens, six have vein 9 absent; two have vein 9 stalked with 10, this stalk being very short; two specimens have veins 8, 9, 10 from a point. In *panda* two specimens are normal and five have vein 9 absent. Evidently the presence of vein 10 and the well-developed frenulum on both sexes would be the only characters that keep this genus out of the *Striphnopterygidae*. The study of the caterpillar, especially that of the first instar, may throw some light on the true position of this genus. The caterpillars live in colonies, which again is not recorded from any other Notodontids, I think; they make large nests of silk, in which they live in the larval stages as well as during pupation. The nest may contain nearly 300 specimens and is usually heavily parasitized by flies or wasps. A Phycitid (*Zophodiopsis hyaenella*) is also supposed to invest the nest of *panda*.

Only two species are found so far in South Africa, and may be separated as follows:

- 1 a. A brown line on fore wing from near base along inner margin to medial line, and another from inner margin near base to median line just below lower median **reticulata**
- b. Fore wing with area from base to median line entirely white, except along costa, where there is a brown edging as in *reticulata* **panda**

ANAPHE RETICULATA.

(Pl. XI, figs. 9-16; Pl. XII, fig. 1.)

Anaphe reticulata Wlk. *Cat.* iv. p. 856 (1855).

Wlshm. *Trans. Lin. Soc. Lond.* 2. II. p. 422 (1885).

Dist. *A.M.N.H.* 6. XX. p. 204 (1897).

Dist. *Ins. Transv.* iv. p. 90, Pl. VIII, fig. 6 (1903).

Arctiomorpha euprepiaeformis Herr.-Schäff. *Aussereur. Schmett.* fig. 434 (1856).

This species also makes nests as recorded of *panda*. I found such a nest at Barberton and bred several specimens out of it, together with specimens of a Hymenopterous and a Dipterous parasite.

My other specimens are from S. Rhodesia (Salisbury, Umvuma); Transvaal (Three Sisters, Kourulene) and Natal (Umkomaas). The parasites emerged in Oct. and the moth came out in Dec.

The Rhodesia specimens have the dark stripes of the fore wing almost black and not brown as in the Transvaal and Natal specimens.

ANAPHE PANDA.

Anaphe panda Boisd. *Voy. Delegorgue en Afr. Austr.* tom. II. p. 600 (1847).

Wlshm. *Trans. Lin. Soc. Lond.* 2. II. p. 425, Pl. 44, 45, fig. 7 (1884).

(Larva) Carl Fromholz. *Berl. entom. Zeits.* Bd. XVII. Heft 1, pp. 9-13 (1883).

I never found the nest of this species, but caught my specimens by lamp-light at Three Sisters, Sarnia, Umkomaas, in Jan.

Genus EPANAPHE.

(Pl. XII, figs. 9-14.)

Epanaphe Auriv. *Arkiv för Zoologi*, Bd. 2. No. 4, p. 8 (1904).Type *moloneyi* Druce. Description from *clarilla*.

♂, ♀. Proboscis absent; palpi porrect, fringed with some long hairs in front and well beyond frons, two jointed; second joint nearly two times first joint; eyes round, moderate, naked; antennae of ♂ nearly till middle of costa, in ♀ shorter, bipectinated to apex, branches in ♂ three times shaft, in ♀ two times, all pointed at ends as in *Anaphe*, but not, or hardly ciliated; shaft well scaled above, first joint globular and with a short tuft of hairs; fore tibia with an inwardly curved process, not quite reaching end of tibia in ♂, in ♀ much shorter still; femurs of all legs with long hairs on upper and under side; tibia with long hairs, especially on inner side of fore leg and on outer side of hind leg; mid and hind tibiae with two moderate spurs each, which are as in *Anaphe*; tarsi of all legs fringed with very long spreading hairs on each joint. Fore wing triangular; costa gently arched; termen straight, oblique; inner margin curved at $\frac{1}{3}$ rd; apex and tornus rounded; 1*b* indistinctly forked at base; 2 from well beyond middle of lower median; 3 from near lower angle; 4 from lower angle and well curved; 5 absent; discocellulars very oblique at lower $\frac{2}{3}$ rd, erect at upper third, where there is an indistinct veinlet in the cell; 6, 7, 8, 10 stalked and from upper angle; stalk of 6 very short; 7 from beyond $\frac{1}{3}$ rd upper angle to apex; 8 to apex; 9 absent; 10 from 8 at about $\frac{1}{3}$ rd upper angle to apex; 11 from near upper angle, parallel to stalk and vein 8; 12 parallel to costa. Hind wing triangular; costa gently arched at middle; termen curved from vein 2 to 6 and very oblique; inner margin well curved at 1*a*; apex and tornus well rounded; 1*a* and 1*b* somewhat curved; 2 from beyond middle of lower median; 3 from $\frac{1}{4}$ th 2 to 4; 4 from lower angle; 5 absent; discocellulars at lower $\frac{2}{3}$ rd very oblique and straight; upper third erect; a trace of a veinlet in the cell; 6 and 7 on a stalk of half of 7 and from upper angle; 8 closely approximated to upper median and almost touching it at basal third. Head and thorax with rather long loose hairs; abdomen of ♀ with a broad hair-tuft as in *Anaphe*; in ♂ with a short tuft of spreading hairs.

I have no doubt that this genus is closely allied to *Anaphe* and most probably it is a development of that genus. The absence of vein 5 in both wings could be expected in such a development, as these veins are already very weak in *Anaphe*; the absence of vein 9 in the fore wing could also be anticipated judging by the behaviour of veins 9 and 10 in that genus. I think, however, that in *Epanaphe* this vein has disappeared through absorption and not through coalescence, as there is a rather sharp bend in vein 8 from where vein 9 may be supposed to have been. Only one species is found in South Africa, which according to Aurivillius may be a local race of *clara*, and which is at any rate closely allied to that species.

EPANAPHE CLARILLA.

(Pl. XII, figs. 9-14.)

Epanaphe clarilla Auriv. *Trans. Ent. Soc. Lond.* p. 699, Pl. XXXIII, fig. 10 (1904).

This species differs from *clara* in the cilia of both wings being pure white and the fore wing being white on the under side with a very narrow costal edging only. This species seems to be confined to Mashonaland, as I have not met with it elsewhere.

I have a ♂ and two ♀s from Salisbury, in Jan. and Dec.

GENERA AUCTORUM.

BRACHIONYCHA PUNCTULATA.

Brachionycha Hübn. *Verz.* p. 144 (1822).

B. punctulata Wlk. *Cat.* VII. p. 1750 (1856).

The species *nubeculosa* and *sphinx* (*cassinea*) for which this genus was created are distinctly **Noctuids** and are placed by all modern classifiers in this group, though Walker and Kirby place them in the **Notodontidae**. Meyrick gives this genus as a synonym of *Asteroscopus* Boisid.

Whether the species *punctulata* belongs to this genus or not is impossible for me to say, as the species is unrecognisable from the description and I have not seen a specimen which can be placed here with certainty.

CATOCHRIA CATOCALOIDES.

Catochria Herr.-Schäff. *Aussereur. Schmett.* I. p. 67 (1855).

C. catocaloides Herr.-Schäff. *l.c.* fig. 380 (1855).

Sir George Hampson informs me, that this species is unknown to him.

DATANA RUFICOLLIS.

Datana Wlk. *Cat.* v. p. 1060 (1855).

D. ruficollis Wlk. *Trans. Ent. Soc. Lond.* 3. I. p. 271 (1862).

Sir George Hampson has kindly informed me, that the genus *Datana* is purely an American genus and that through the kindness of Prof. Poulton, he has been able to see the type of *ruficollis*, which is in the Oxford Museum. He found that *D. ruficollis* Wlk. is the same as *D. ministra* Drury from North America and that the type specimen must have a wrong label attached.

SOMERA POLIOSTROTA.

Somera Wlk. *Cat.* IV. p. 882 (1855).

S. poliostrota Hmps. *A.M.N.H.* 8. vol. v. p. 463 (1910).

Sir George was kind enough to send me the following description of this genus, based on *S. poliostrota*: Palpi obliquely upturned to about middle of frons and fringed with long hairs in front, third joint as long as second and correct, smooth; eyes smooth; antennae with long branches, about six times shaft, to apex; hind tibia with two pairs of spurs; thorax and abdomen without crests; fore wing rather narrow, the apex somewhat produced, no pecten on inner margin, vein 3 well before angle, 5 from middle of discocellulars, 6 from upper angle, 9 and 10 anastomosing with 8 to form a short areole of about $\frac{1}{6}$ th to apex; hind wing with 3 and 4 from angle, 5 from middle of discocellulars, 6 and 7 stalked.

GENERA OMITTED.

ATRASANA. The species *postica* placed in this genus before, is to be placed in *Hoplitis*.

INOUS is a Limacodid.

OSICA Wlk. is a genus from Queensland and N. Guinea. The species *verulama* B. Baker placed before in this genus is the same as *A. bicolor*.

EUTIMIA in which *marpissa* is placed, is *Zana spurcata*.

ALPHABETICAL INDEX

- agramma (Desmeocraera), 191
 agramma (Phyllaliodes), 192
 albicans (Pseudorethona), 169
 albicostata (Scalmicauda), 160
 albida (Antheua), 178
 AMYOPS, 206
 ANAPHE, 232
 anodonta (Zana), 222
 ANTHEUA, 175
 ARCTIOMORPHA, 232
 argentescens (Cerura), 171
 ATRASANA, 203
 atribasalis (Desmeocraera), 191
 atrifrons (Scranacia), 211
 atriguttata (Desmeocraera), 186
 aurifodinae (Antheua), 179

 basalis (Desmeocraera), 186
 basipuncta (Antheua), 178
 bicolor (Antheua), 180
 bifasciata (Cerura), 171
 BRACHIONYCHA, 235
 BREYERIA, 213
 brunnea (Eurystaura), 216

 calliope (Desmeocraera), 186
 CAMPYLOCTYS, 219
 canescens (Desmeocraera), 188
 CATOCHRIA, 235
 CERURA, 170
 CHADISRA, 200
 cinerea (Taeniopteryx), 212
 clarilla (Epanaphe), 234
 concolor (Hoplitis), 204
 congruata (Phycitimorpha), 209
 consanguinea (Antheua), 180
 CRAMBOMETRA, 218
 croceipuncta (Antheua), 178
 curvilinea (Chadisra), 201

 dasychira (Ramesa), 223
 dasychiroides (Breyeria), 214
 dasychiroides (Hoplitis), 204
 DATANA, 235
 derelicta (Crambometra), 219

 DESMEOCRAERA, 183
 dimorpha (Antheua), 180

 elegans (Leucophalera), 199
 encausta (Antheua), 179
 EPANAPHE, 234
ephippiata (*Sirenoptyga*), 177
 esmeralda (Cerura), 172
euprepiaeformis (*Anaphe*), 233
 EURYSTAURA, 216
 EUTIMIA, 221

 flavida (Pydna), 229
 fuscata (Polienus), 225

 GALONA, 205
 gigas (Amyops), 207
 gladstonei (Campyloctys), 220
 griseitincta (Scalmicauda), 160
 griseiviridis (Desmeocraera), 191

 HENOSIS, 232
 heterogyna (Scalmicauda), 159
 hierax (Pararethona), 174
 HOPLITIS, 203
HYBOCAMPA, 203
 HYPOPHIALA, 192

ianthina (*Desmeocraera*), 186
 ICHTHYURA, 161
 imitata (Phalera), 196
 impedita (Stenostaura), 215
 incana (Desmeocraera), 189
 interpellatrix (Desmeocraera), 185

 lentisignata (Ichthyura), 162
 LEUCOPHALERA, 199
 lignitea (Phalera), 197
 LOPHOPTERYX, 166
 lydenburgi (Phalera), 197

 macrodonta (Ramesa), 223
 marpissa (Zana), 222
 marshalli (Cerura), 173
 mediata (Stauropus), 195

melanogramma (Hypophiala), 193
MELEBAEAS, 206
 mixta (Antheua), 182
 modestus (Polienus), 224

NETRIA, 194
 nigrosarsa (Polienus), 225
 noctuiformis (Pectinophora), 165
NOTOXANTHA, 217

octoginta (Desmeocraera), 191
 o'neili (Prionocentrum), 226
 o'neili (Scalmicauda), 160
 ornata (Rigema), 198
OSICA, 180

panda (Anaphe), 233
PARARETHONA, 173
PECTINOPHORA, 164
 pergrisea (Desmeocraera), 191
 peringueyi (Antheua), 182
 persimilis (Chadistra), 202
PHALERA, 195
PHYCITIMORPHA, 208
PHYLLALIODES, 192
 phyllocampa (Hoplitis), 204
 platti (Desmeocraera), 190
 plumitarsus (Polelassothys), 230
POLELASSOTHYS, 229
POLIENUS, 223
 postica (Hoplitis), 204
PRIONOCENTRUM, 226
PSEUDORETHONA, 168
PYDNA, 228
pyrrotricha (Galona), 206

RAMESA, 222
 reticulata (Anaphe), 233
RIGEMA, 197

roseotincta (Ichthyura), 163
 rosinaria (Chadistra), 202
 rubrifascia (Pydna), 229
 rubritincta (Pydna), 229

SCALMICAUDA, 158
SCRANCIA, 210
 semiflava (Chadistra), 202
 serena (Galona), 206
 sesamiodes (Notoxantha), 218
 simplex (Antheua), 177
SIRENOPYGA, 175
SOMERA, 235
 spiritalis (Cerura), 173
spurcata (Antheua), 222
STAUROPLUS, 194
 steniptera (Desmeocraera), 191
STENOSTAURA, 215
 stictica (Scrancia), 211
 stigmatica (Phycitimorpha), 208
 swierstrae (Cerura), 173

TAENIOPTERYX, 212
 thalassina (Desmeocraera), 187
 tricolor (Antheua), 179
 tripuncta (Desmeocraera), 189

uncifera (Chadistra), 202
 uniformis (Lophopteryx), 167

varia (Antheua), 179
 varia (Desmeocraera), 187
 vernalis (Desmeocraera), 186
verulana (Osica), 180
 violacearia (Ichthyura), 163

woerdeni (Rigema), 198

ZANA, 221



PLATES I—XIV

ERRATA

Plate I add FIG. 6. *Ichthyura roseotincta* ♂.—Wings $\times 2$.

Plate V, Figs. 11-14, for *Amyopa* read *Amyops*

Plate V, Fig. 19 and Plate IX, Figs. 18-23, for *Burnuparia nigropulverata* read
Crambometra derelicta.

Plate V, Fig. 20, for *Campyloctis* read *Campyloctys*.

Plate I.

FIG. 1. *Scalmicauda a bicostata* ♂.—Wings $\times 1\frac{1}{2}$.

FIG. 2. *Sc. heterogyne* ♂.—Head and thorax $\times 2\frac{1}{2}$.

FIG. 3. *Sc. albicostata* ♂.—Head and tho ax $\times 2\frac{1}{2}$.

FIG. 4. *Sc. o'neili* ♂.—Head and thorax $\times 2\frac{1}{2}$.

FIG. 5. *Sc. o'neili*.—Portion of antenna $\times 5$.

FIG. 7. *Pectinophora noctuiformis* ♂ $\times 2$.

FIG. 8. *Lophopteryx uniformis* ♂ $\times 1\frac{1}{2}$.

FIG. 9. *Pseudorethona albicans* ♂ $\times 2$.

FIG. 10. *Cerura spiritalis* ♀ $\times 1\frac{1}{2}$.

FIGS. 11-16. *Pararethona hierax* ♂.—Fig. 11, wings $\times 2\frac{1}{2}$; fig. 12, tip of antenna $\times 6$; fig. 13, hind leg $\times 6$; fig. 14, mid spur of hind leg $\times 16$; fig. 15, palpus $\times 6$; fig. 16, fore leg $\times 6$.

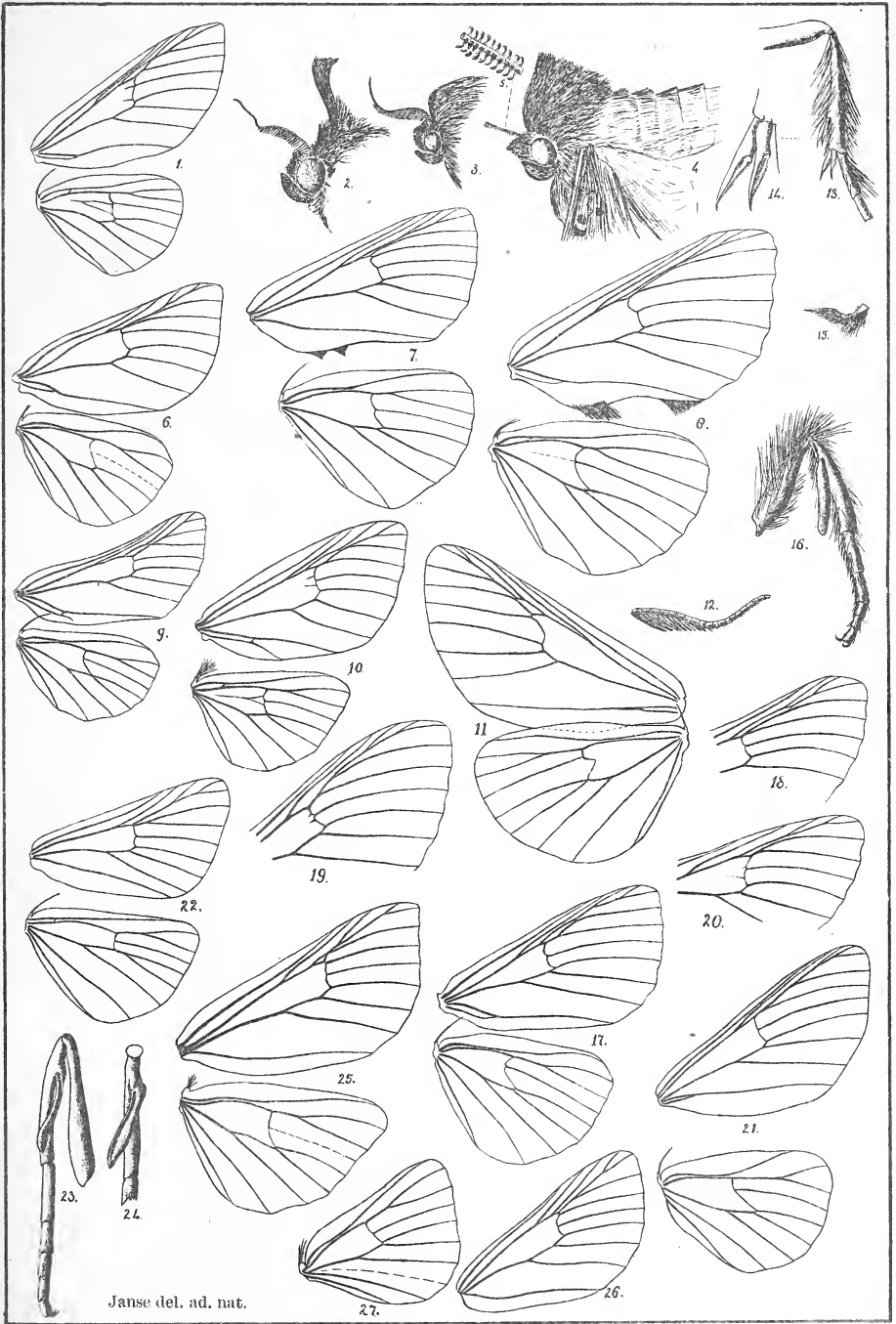
FIGS. 17-20. *Antheua*.—Fig. 17, *A. tricolor* ♂ $\times 1\frac{1}{2}$; fig. 18, *A. simplex* $\times 1\frac{1}{2}$; fig. 19, *A. croceipuncta* (not typical) $\times 1\frac{1}{2}$; fig. 20, *A. bicolor* (not typical) $\times 1\frac{1}{2}$.

FIG. 21. *Desmeocræra interpellatrix* ♂ $\times 1\frac{1}{2}$.

FIGS. 22-24. *Phyllaliodes agramma* ♂.—Fig. 22, wing $\times 1\frac{1}{2}$; fig. 23, denuded fore legs (outside view) $\times 6$; fig. 24, same turned one quarter $\times 6$.

FIG. 25. *Antheua dimorpha* ♀, wings $\times 2$.

FIGS. 26-27. *Hypophiala melanogramma* ♀.—Fig. 26, fore wing $\times 1\frac{1}{2}$; fig. 27, hind wing $\times 1\frac{1}{2}$.



Janse del. ad. nat.

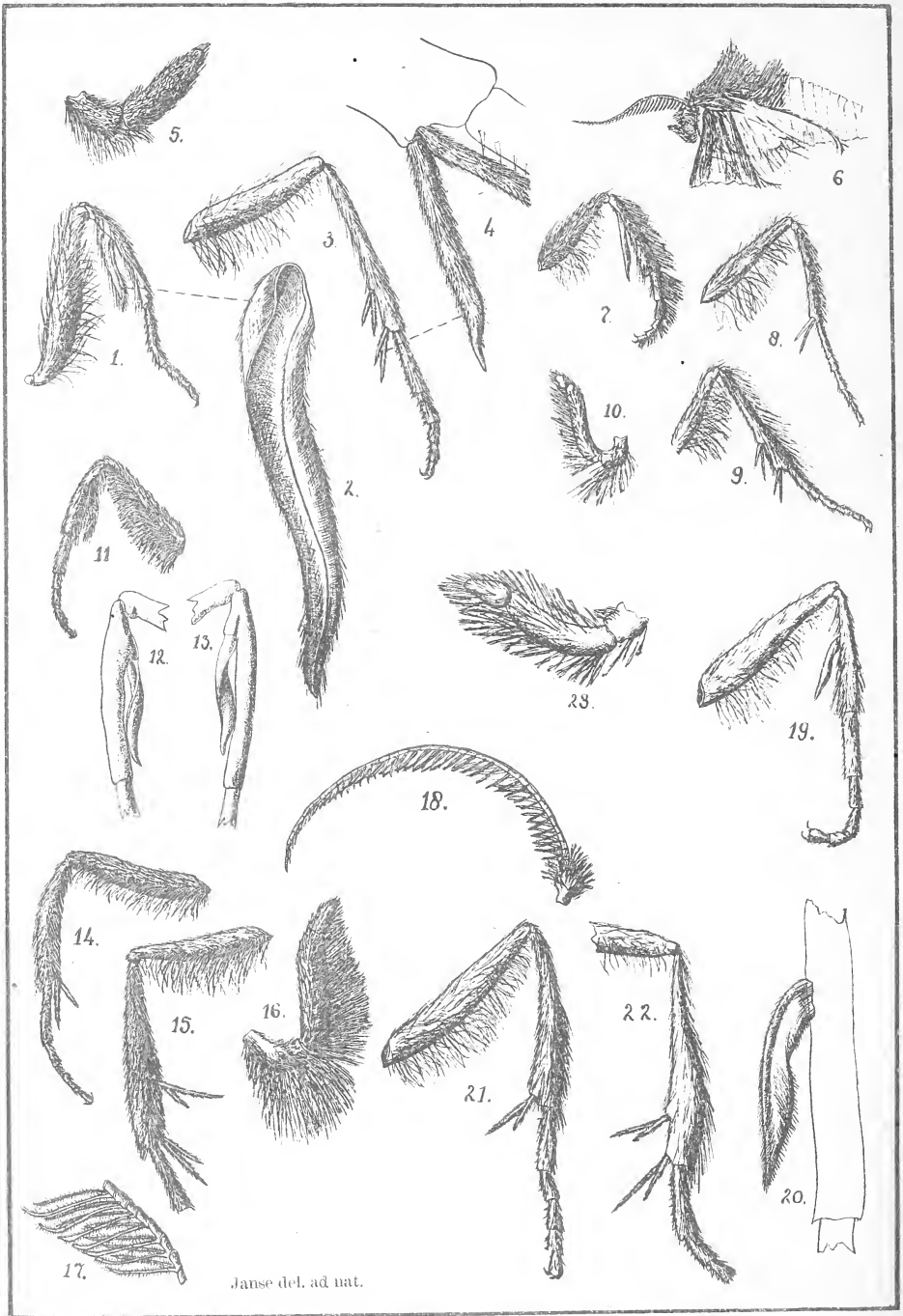


Plate II.

FIGS. 1-5. *Scalmicauda albicostata* ♂.—Fig. 1, fore leg $\times 5$; fig. 2, process of fore leg (inside view) $\times 36$; fig. 3, hind leg $\times 5$; fig. 4, end spur of hind leg $\times 36$; fig. 5, palpus $\times 12$.

FIGS. 6-10. *Ichthyura roseotincta* ♂.—Fig. 6, side view of head and thorax $\times 3$; fig. 7, fore leg $\times 5$; fig. 8, mid leg $\times 5$; fig. 9, hind leg $\times 5$; fig. 10, palpus $\times 10$.

FIGS. 11-17. *Pectinophora noctuiformis* ♂.—Fig. 11, fore leg $\times 5$; fig. 12, fore leg denuded (inside view) $\times 11$; fig. 13, fore leg denuded (outside view) $\times 11$; fig. 14, mid leg $\times 5$; fig. 15, hind leg $\times 5$; fig. 16, palpus $\times 11$; fig. 17, portion of antenna $\times 11$.

FIGS. 18-23. *Lophopteryx uniformis* ♂.—Fig. 18, antenna $\times 5$; fig. 19, fore leg $\times 5$; fig. 20, process of fore leg $\times 15$; fig. 21, mid leg $\times 6$; fig. 22, hind leg $\times 5$; fig. 23, palpus $\times 15$.

Plate III.

FIGS. 1-6. *Pseudorethona albicans* ♂.—Fig. 1, fore leg $\times 5$; fig. 2, fore tibia denuded $\times 11$; fig. 3, mid leg $\times 5$; fig. 4, hind leg $\times 5$; fig. 5, spurs of hind tibia $\times 18$; fig. 6, palpus $\times 5$.

FIGS. 7-9. *Cerura spiritalis* ♀.—Fig. 7, palpus $\times 11$; fig. 8, basal part of antenna $\times 11$; fig. 9, portion of shaft of antenna with a branch $\times 35$.

FIGS. 10-15. *Anthea tricolor* ♂.—Fig. 10, fore leg $\times 5$; fig. 11, process of fore leg $\times 12$; fig. 12, mid leg $\times 11$; fig. 13, hind leg $\times 5$; fig. 14, spur of hind leg $\times 12$; fig. 15, palpus $\times 12$.

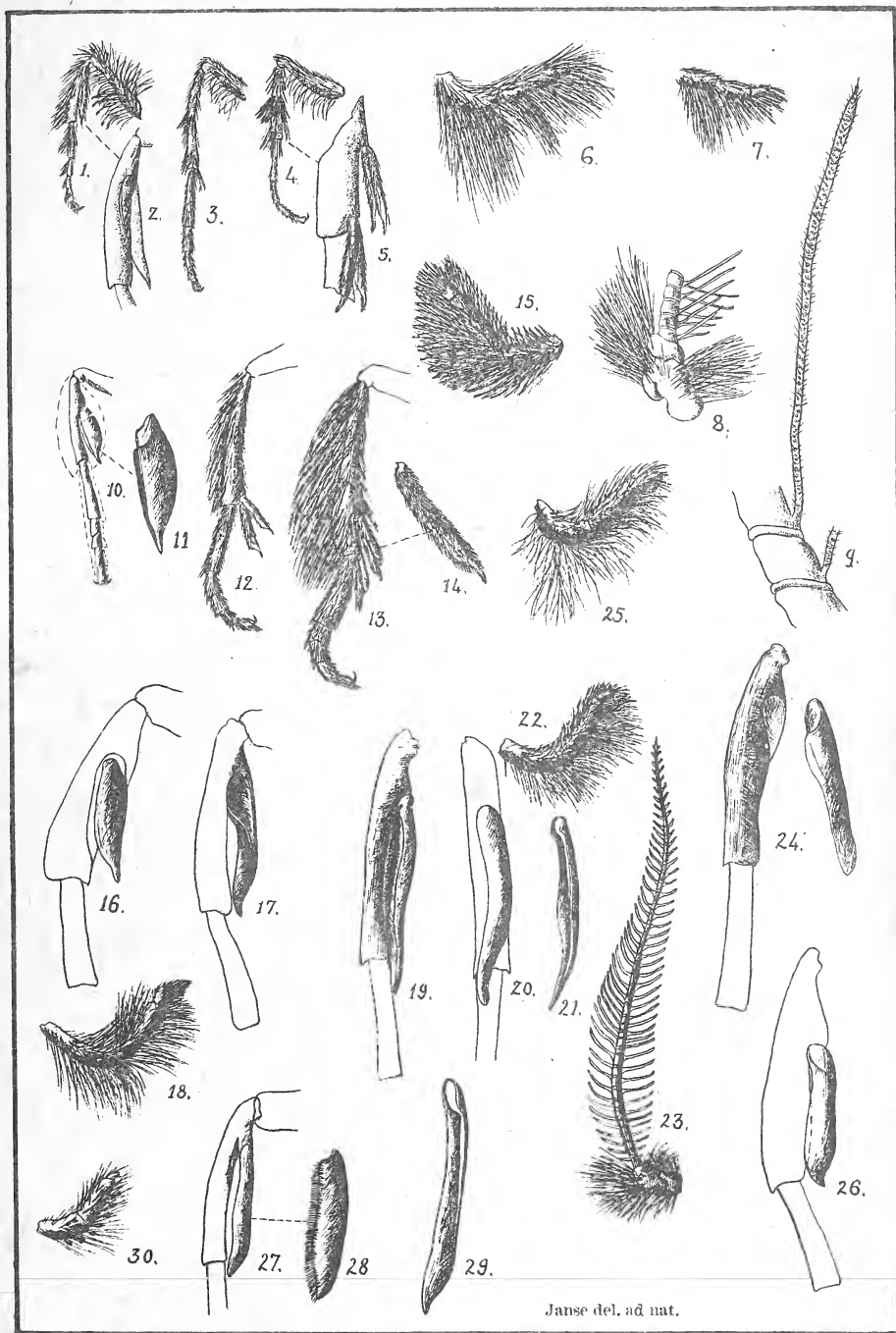
FIGS. 16-18. *A. encausta* ♂.—Fig. 16, fore tibia $\times 5$; fig. 17, fore tibia with process turned to show inner side $\times 5$; fig. 18, palpus $\times 11$.

FIGS. 19-23. *A. croceipuncta* ♂.—Fig. 19, fore tibia $\times 5$; fig. 20, fore tibia turned one quarter $\times 5$; fig. 21, process of fore tibia seen from inner side $\times 5$; fig. 22, palpus $\times 11$; fig. 23, antenna $\times 5$.

FIGS. 24-25. *A. bicolor* ♂.—Fig. 24, fore tibia with removed process $\times 11$; fig. 25, palpus $\times 11$.

FIG. 26. Fore tibia of *A. simplex* ♂ $\times 11$.

FIGS. 27-30. *A. aurifodinae*.—Fig. 27, fore tibia $\times 11$; fig. 28, process of fore tibia turned one quarter $\times 11$; fig. 29, same process turned half-way $\times 18$; fig. 30, palpus $\times 11$.



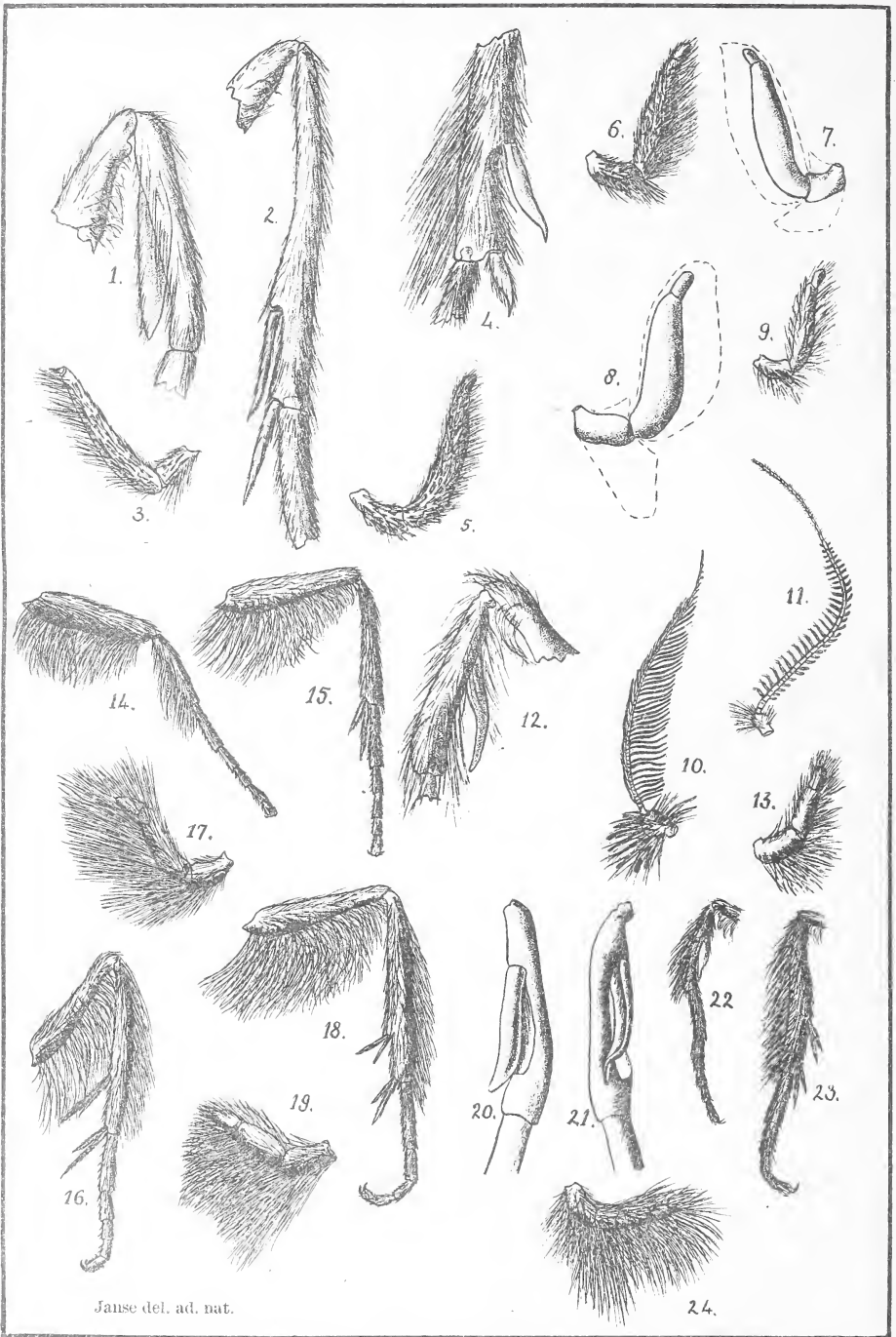


Plate IV.

FIGS. 1-3. *Desmeocera interpellatrix* ♂.—Fig. 1, fore tibia $\times 11$; fig. 2, hind tibia $\times 11$; fig. 3, palpus $\times 11$.

FIGS. 4-5. *D. calliope*.—Fig. 4, hind tibia $\times 11$; fig. 5, palpus $\times 11$.

FIGS. 6-9.—Palpi $\times 11$: fig. 6 of *D. vernalis*; fig. 7 of *D. varia*; fig. 8 of *D. atriguttata*; fig. 9 of *D. thalassina*.

FIGS. 10-11. Antennæ $\times 5$: fig. 10 of *D. interpellatrix*; fig. 11 of *D. steniptera*.

FIG. 12. Fore tibia of *D. steniptera* $\times 11$; fig. 13, palpus of same $\times 11$.

FIGS. 14-17. *Antheua dimorpha* ♀.—Fig. 14, fore leg $\times 5$; fig. 15, mid leg $\times 5$; fig. 16, hind leg $\times 5$; fig. 17, palpus $\times 11$.

FIGS. 18-19. *Phyllaliodes agramma* ♀.—Fig. 18, hind leg $\times 5$; fig. 19, palpus $\times 11$.

FIGS. 20-24. *Hypophiala melanogramma* ♀.—Fig. 20, fore tibia with process from the inner side $\times 11$; fig. 21, same turned one quarter $\times 11$; fig. 22, fore leg $\times 5$; fig. 23, hind leg $\times 5$; fig. 24, palpus $\times 11$.

Plate V.

FIGS. 1-3. *Cecura spiritalis* ♀.—Fig. 1, fore leg $\times 5$; fig. 2, hind leg $\times 5$; fig. 3, spurs of hind leg $\times 17$.

FIG. 4. *Stauropus mediata* ♀, wings $\times 2$.

FIG. 5. *Phalera imitata* ♂, wings $\times 1\frac{1}{2}$.

FIG. 6. *Ph. lydenburgi* ♂, tip of fore wing $\times 1\frac{1}{2}$.

FIG. 7. *Rigema ornata* ♀, wings $\times 1\frac{1}{2}$.

FIG. 8. *Leucophalera elegans* ♂, wings $\times 1$.

FIG. 9. *Chadisra curvilinea* ♀, wings $\times 2$.

FIG. 10. *Galona serena* ♂, wings $\times 1\frac{1}{2}$.

FIGS. 11-14. *Anyopa gigus* ♂.—Fig. 11, wings $\times 1$; fig. 12, fore leg $\times 2\frac{1}{2}$; fig. 13, mid leg $\times 2\frac{1}{2}$; fig. 14, hind leg $\times 2\frac{1}{2}$.

FIG. 15. *Scrancia stictica* ♀, wings $\times 1\frac{1}{2}$.

FIG. 16. *Breyeria dasychiroides* ♂, wings $\times 2\frac{1}{2}$.

FIG. 17. *Stenostaura impedita* ♀, wings $\times 2\frac{1}{2}$.

FIG. 18. *Notocantha sesamiodes* ♂, wings $\times 2$.

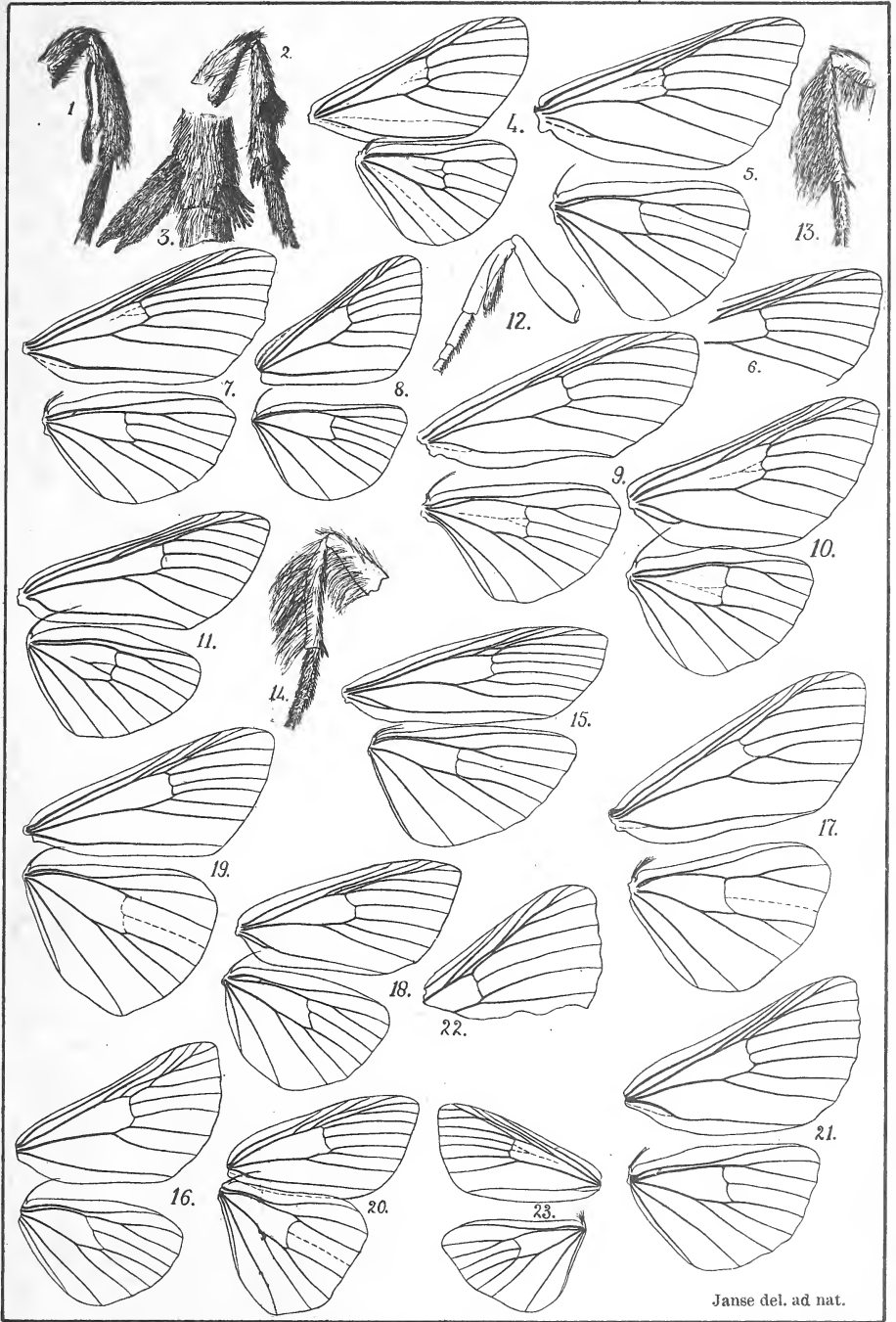
FIG. 19. *Burnuparia nigropulverata* ♂, wings $\times 2$.

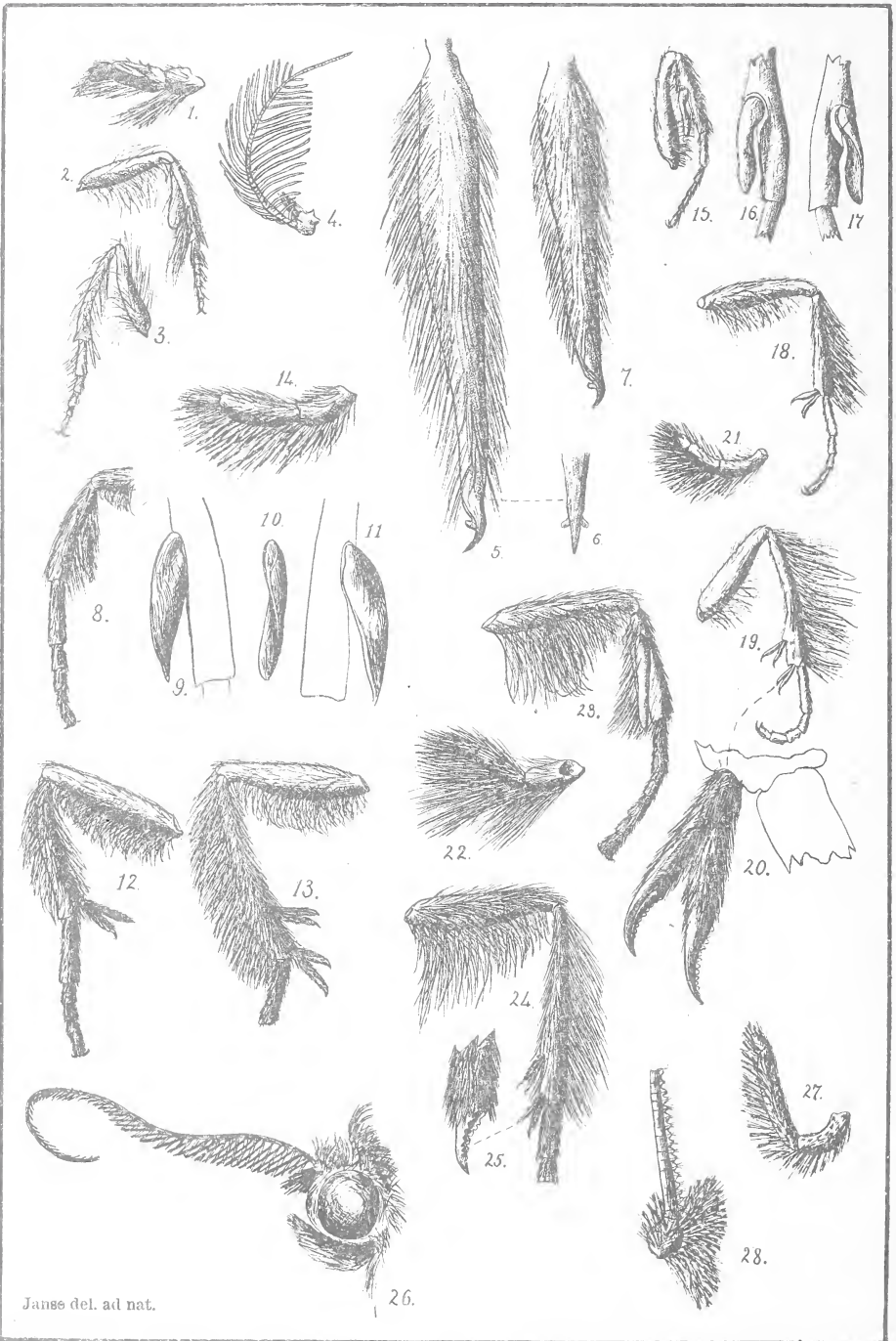
FIG. 20. *Campyloctis gladstonei* ♂, wings $\times 2$.

FIG. 21. *Zana marpissa* ♀, wings $\times 2$.

FIG. 22. *Zana anodonta* ♂, apical part of fore wing $\times 2\frac{1}{2}$.

FIG. 23. *Ramesa macrodonta* ♀, $\times 1$.





Janss del. ad nat.

Plate VI.

FIGS. 1-7. *Stauropus mediata* ♂.—Fig. 1, palpus $\times 11$; fig. 2, fore leg $\times 5$; fig. 3, hind leg $\times 5$; fig. 4, antenna $\times 5$; fig. 5, inner spur of hind tibia $\times 65$ (side view); fig. 6, apical part of same spur seen from the top $\times 65$; fig. 7, outer spur of hind leg (side view) $\times 65$.

FIGS. 8-14. *Phalera imitata* ♂.—Fig. 8, fore leg $\times 5$; fig. 9, process of fore tibia $\times 11$ (inner side); fig. 10, same turned one quarter; fig. 11, same seen from the outside, all $\times 11$; fig. 12, mid leg $\times 5$; fig. 13, hind leg $\times 5$; fig. 14, palpus $\times 11$.

FIGS. 15-21. *Rigema ornata* ♂.—Fig. 15, fore leg $\times 5$; fig. 16, process of fore tibia (from outside) $\times 11$; fig. 17, same seen from inner side; fig. 18, mid leg $\times 5$; fig. 19, hind leg $\times 5$; fig. 20, end spur of hind leg $\times 34$; fig. 21, palpus $\times 11$.

FIGS. 22-25. *Leucophalera elegans* ♂.—Fig. 22, palpus $\times 11$; fig. 23, fore leg $\times 5$; fig. 24, hind leg $\times 5$; fig. 25, terminal part of spur from hind leg $\times 34$.

FIGS. 26-28. *Chadisra*.—Fig. 26, head of *Ch. rosinaria* ♂ $\times 5$; fig. 29, palpus of *Ch. curvilinea* ♂ $\times 11$; fig. 28, lower portion of antenna of same $\times 11$.

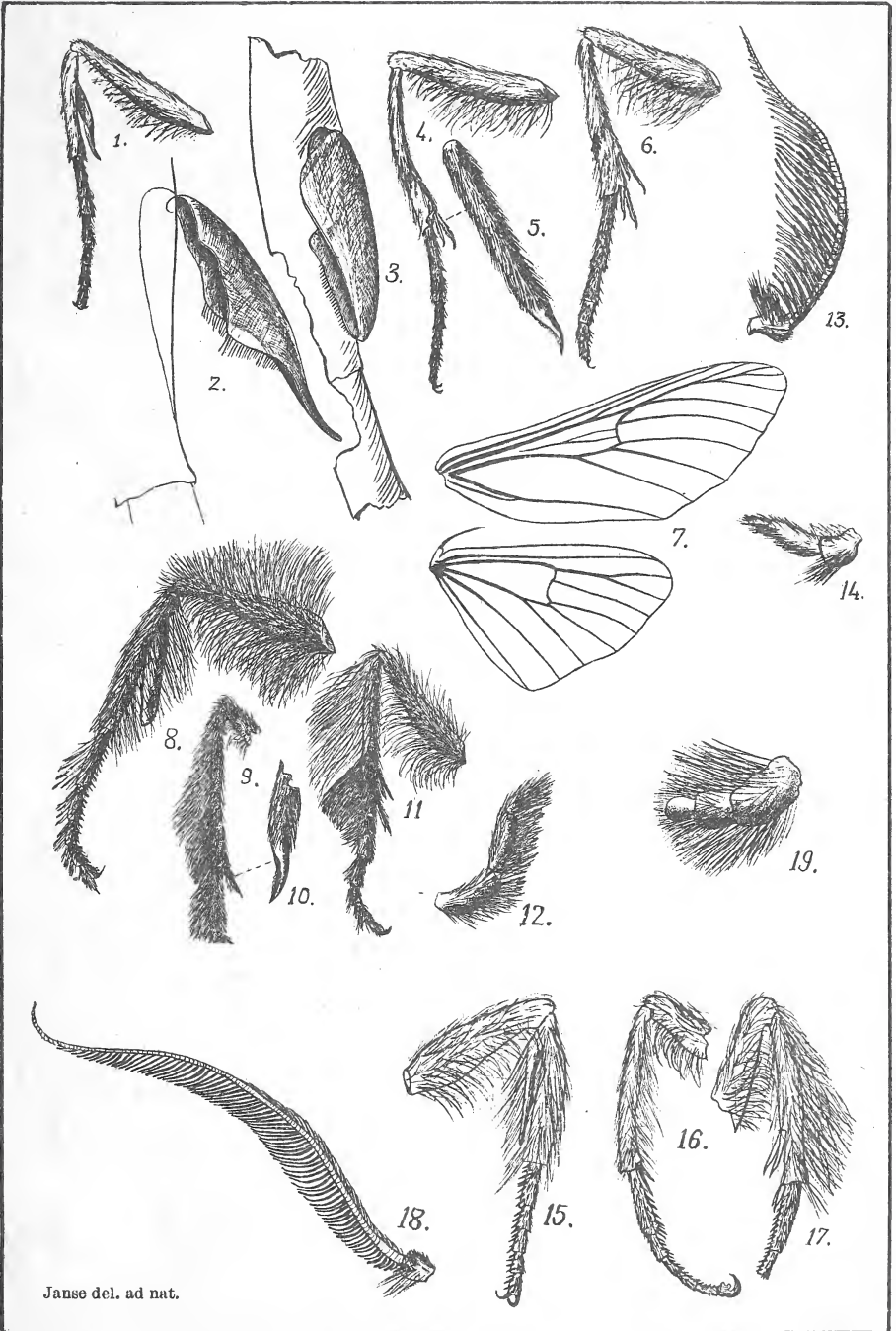
Plate VII.

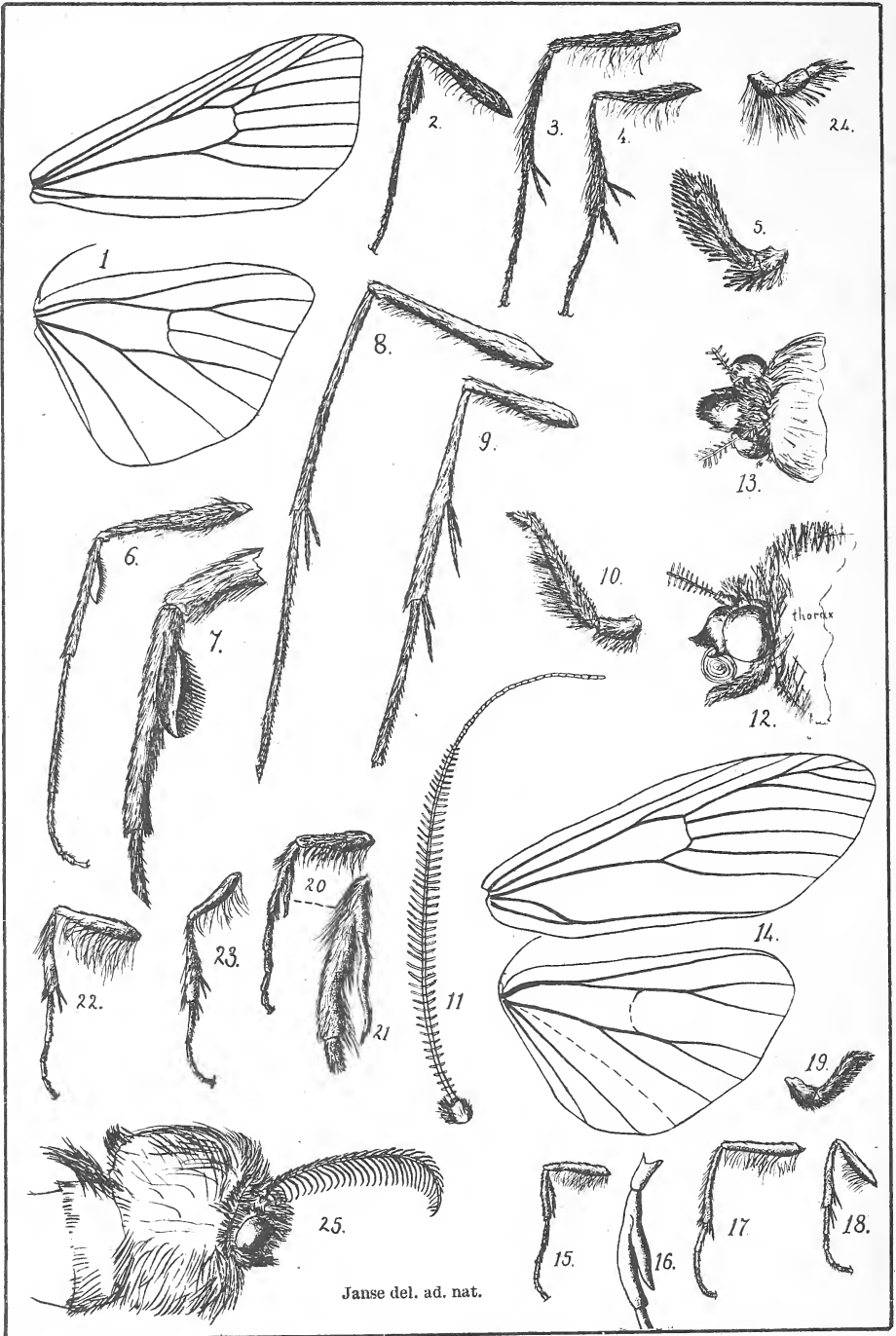
FIGS. 1-6. *Chadisra curvilinea* ♀.—Fig. 1, fore leg $\times 5$; fig. 2, process of fore tibia $\times 34$ (♀); fig. 3, same of ♂; fig. 4, mid leg $\times 5$; fig. 5, spur of hind tibia $\times 34$; fig. 6, hind leg $\times 5$.

FIGS 7-12. *Hoplitis dasychiroides* ♂.—Fig. 7, wings $\times 2$; fig. 8, fore leg $\times 5$; fig. 9, mid leg $\times 5$; fig. 10, terminal part of spur of mid tibia $\times 34$; fig. 11, hind leg $\times 5$; fig. 12, palpus $\times 11$.

FIGS. 13-17. *Galona serena* ♂.—Fig. 13, antenna $\times 5$; fig. 14, palpus $\times 11$; fig. 15, fore leg $\times 5$; fig. 16, mid leg $\times 5$; fig. 17, hind leg $\times 5$.

FIGS. 18-19. *Amyops gigas* ♂.—Fig. 18, antenna $\times 5$; fig. 19, palpus $\times 20$.





Janse del. ad. nat.

Plate VIII.

FIGS. 1-5. *Phycitomorpha stigmatica* ♂.—Fig. 1, fore wings $\times 3$; fig. 2, fore leg $\times 5$; fig. 3, mid leg $\times 5$; fig. 4, hind leg $\times 5$; fig. 5, palpus $\times 11$.

FIGS. 6-13. *Seranicia stictica* ♀.—Fig. 6, fore leg $\times 5$; fig. 7, process of fore tibia $\times 11$; fig. 8, mid leg $\times 5$; fig. 9, hind leg $\times 5$; fig. 10, palpus $\times 11$; fig. 11, antenna $\times 5$; fig. 12, head from side $\times 5$; fig. 13, head from above $\times 5$.

FIGS. 14-19. *Teniopteryx cinerea* ♂.—Fig. 14, wings $\times 5$; fig. 15, fore leg $\times 5$; fig. 16, fore leg denuded $\times 11$; fig. 17, mid leg $\times 5$; fig. 18, hind leg $\times 5$; fig. 19, palpus $\times 11$.

FIGS. 20-25. *Breyeria dasychiroides* ♂.—Fig. 20, fore leg $\times 5$; fig. 21, fore tibia $\times 11$; fig. 22, mid leg $\times 5$; fig. 23, hind leg $\times 5$; fig. 24, palpus $\times 11$; fig. 25, head and thorax $\times 5$.

Plate IX.

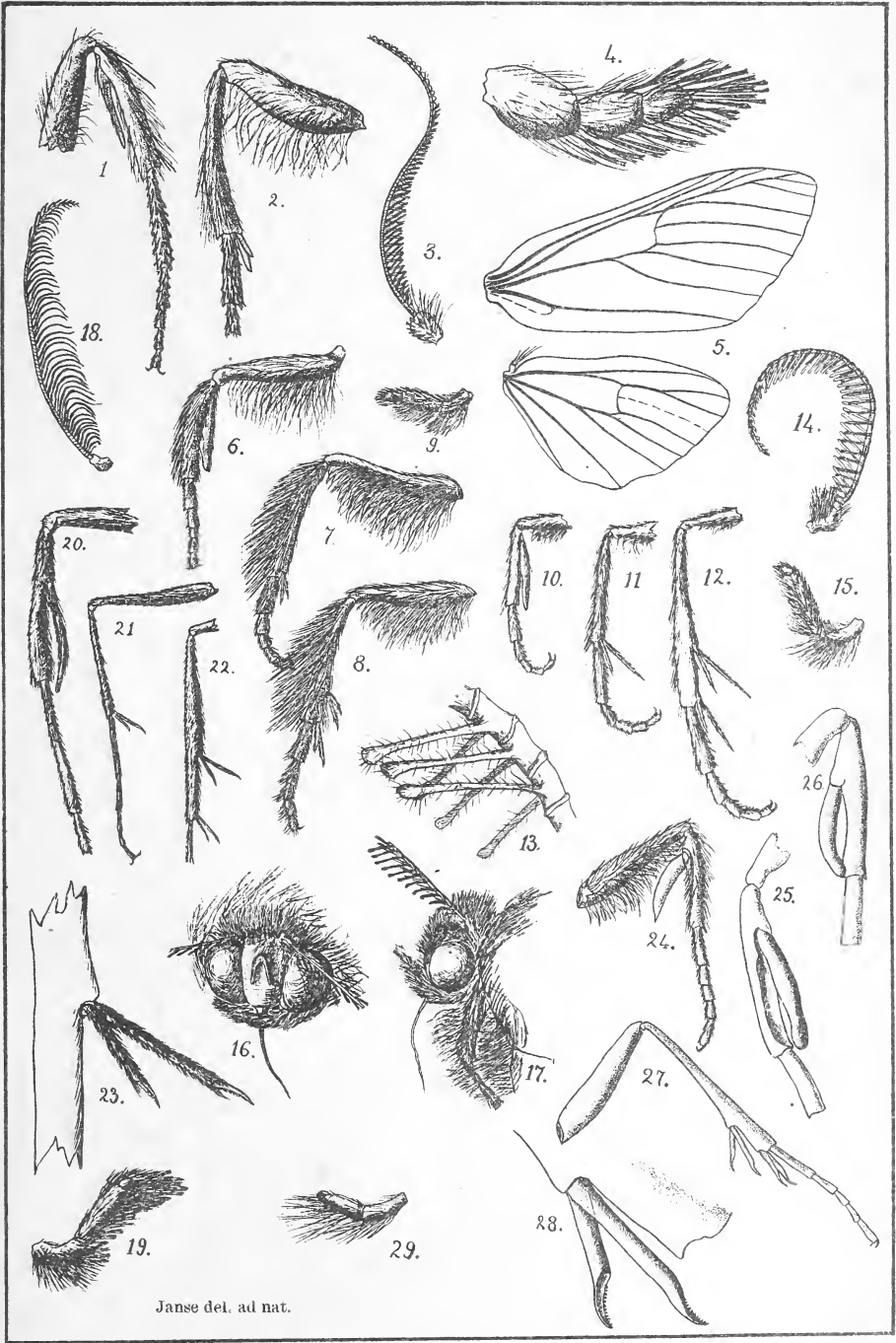
FIGS. 1-4. *Stenostaura impedita* ♂.—Fig. 1, fore leg $\times 11$; fig. 2, hind leg $\times 11$; fig. 3, antenna $\times 11$; fig. 4, palpus $\times 64$.

FIGS. 5-9. *Eurystaura brunnea* ♂.—Fig. 5, wings of ♀ $\times 3$; fig. 6, fore leg $\times 5$; fig. 7, mid leg $\times 5$; fig. 8, hind leg $\times 5$; fig. 9, palpus $\times 11$.

FIGS. 10-17. *Notoxantha sesamiodes* ♂.—Fig. 10, fore leg $\times 5$; fig. 11, mid leg $\times 5$; fig. 12, hind leg $\times 5$; fig. 13, portion of antenna $\times 34$; fig. 14, antenna $\times 5$; fig. 15, palpus $\times 11$; fig. 16, head with frons denuded $\times 5$; fig. 17, head (side view) $\times 5$.

FIGS. 18-23. *Burnuparia nigropulverata* ♂.—Fig. 18, antenna $\times 5$; fig. 19, palpus $\times 11$; fig. 20, fore leg $\times 11$; fig. 21, mid leg $\times 5$; fig. 22, hind leg $\times 5$; fig. 23, mid spur of hind leg $\times 20$.

FIGS. 24-29. *Zana marpissa* ♂.—Fig. 24, fore leg $\times 5$; fig. 25, fore leg from inner side (denuded) $\times 11$; fig. 26, same seen from the outer side $\times 11$; fig. 27, hind leg $\times 5$; fig. 28, mid spur of hind tibia $\times 20$; fig. 29, palpus $\times 11$.



Janse del. ad nat.

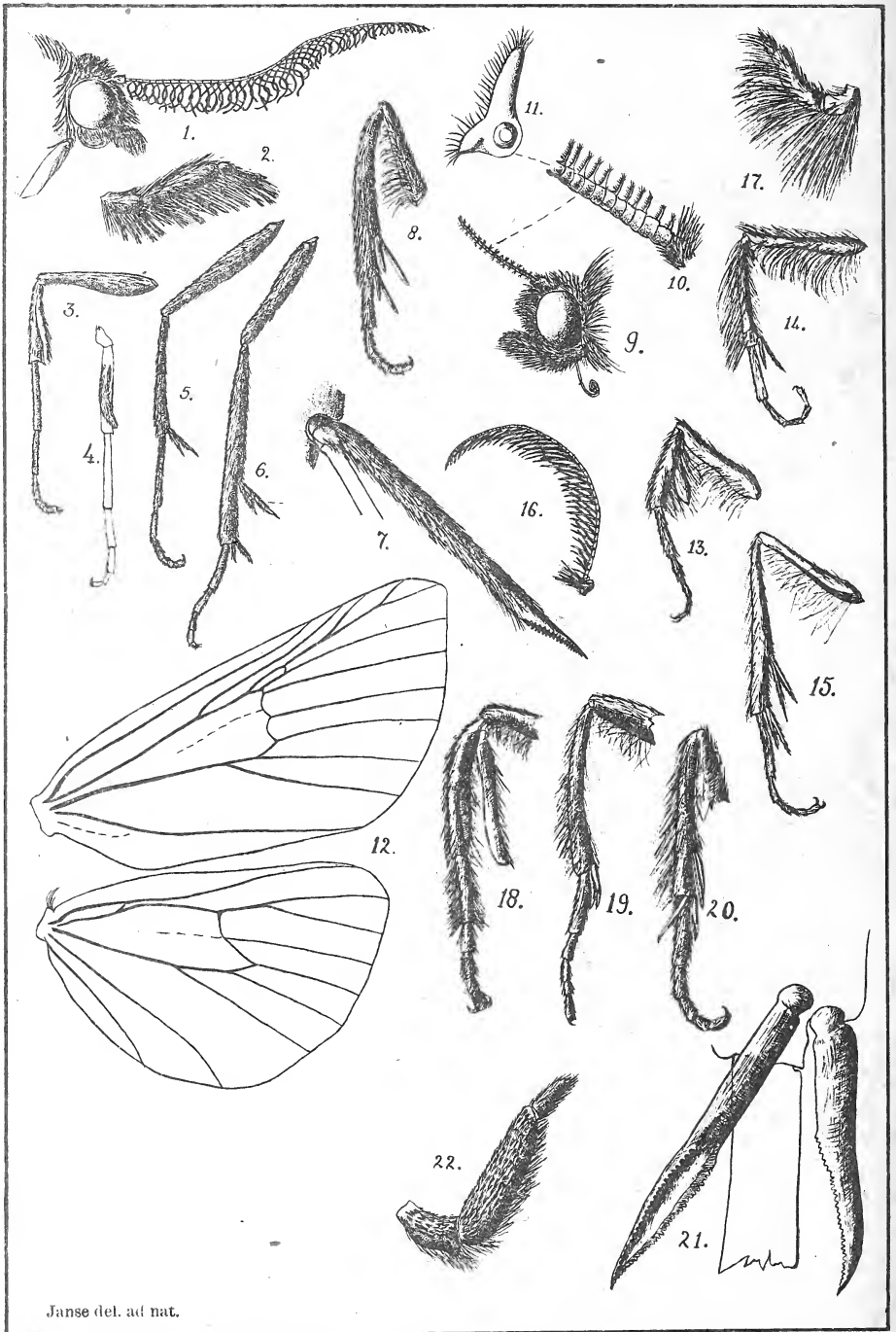


Plate X.

FIGS. 1-7. *Campyloctys gladstonei* ♂.—Fig. 1, head $\times 5$; fig. 2, palpus $\times 11$; fig. 3, fore leg $\times 5$; fig. 4, fore leg seen from the inner side $\times 5$; fig. 5, mid leg $\times 5$; fig. 6, hind leg $\times 5$; fig. 7, mid spur of hind leg $\times 25$.

FIGS. 8-11. *Ramesa macrodonta* ♀.—Fig. 8, hind leg $\times 2$; fig. 9, head $\times 5$; fig. 10, basal portion of antenna $\times 11$; fig. 11, joint of antenna seen from the front $\times 35$.

FIGS. 12-17. *Polienus modestus* ♂.—Fig. 12, wings of ♀ $\times 4$; fig. 13, fore leg $\times 5$; fig. 14, mid leg $\times 5$; fig. 15, hind leg $\times 5$; fig. 16, antenna $\times 5$; fig. 17, palpus $\times 11$.

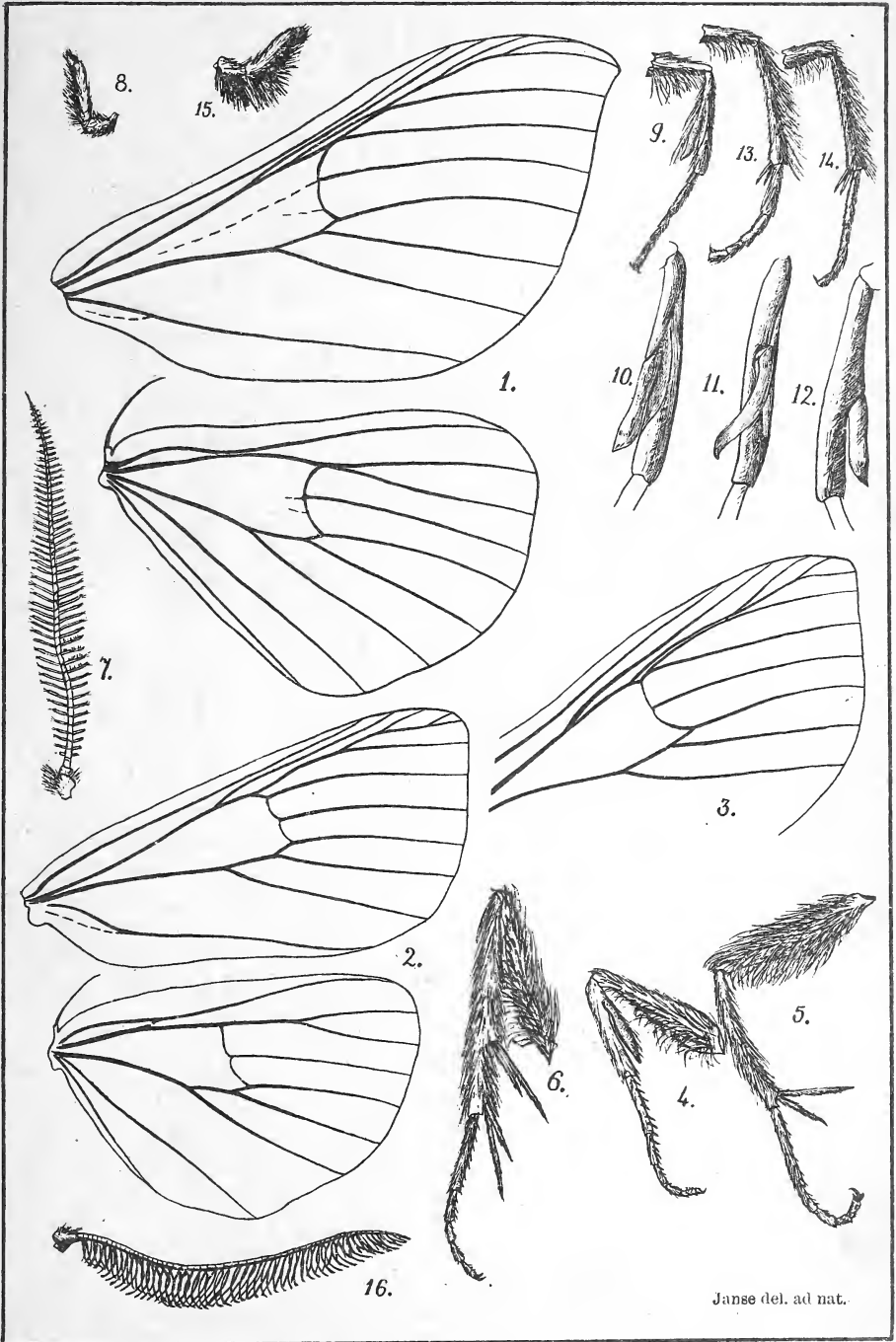
FIGS. 18-22. *Prionotocentrum o'neili* ♂.—Fig. 18, fore leg $\times 5$; fig. 19, mid leg $\times 5$; fig. 20, hind leg $\times 5$; fig. 21, terminal spurs of hind leg $\times 34$; fig. 22, palpus $\times 11$.

Plate XI.

FIG. 1. Wings of *Prionotocentrum o'neili* ♂ × 3.

FIGS. 2, 4-8. *Pydna rubritincta* ♂.—Fig. 2, wings × 4; fig. 3, part of fore wing of *P. rubrifascia* × 5; fig. 4, fore leg × 5; fig. 5, mid leg × 5; fig. 6, hind leg × 5; fig. 7, antenna × 5; fig. 8, palpus × 5.

FIGS. 9-16. *Anaphe reticulata* ♂.—Fig. 9, fore leg × 5; fig. 10, process of fore tibia (denuded) × 11; fig. 11, same turned one quarter; fig. 12, same turned half-way; fig. 13, mid leg × 5; fig. 14, hind leg × 5; fig. 15, palpus × 11; fig. 16, antenna × 5.



Janse del. ad nat.

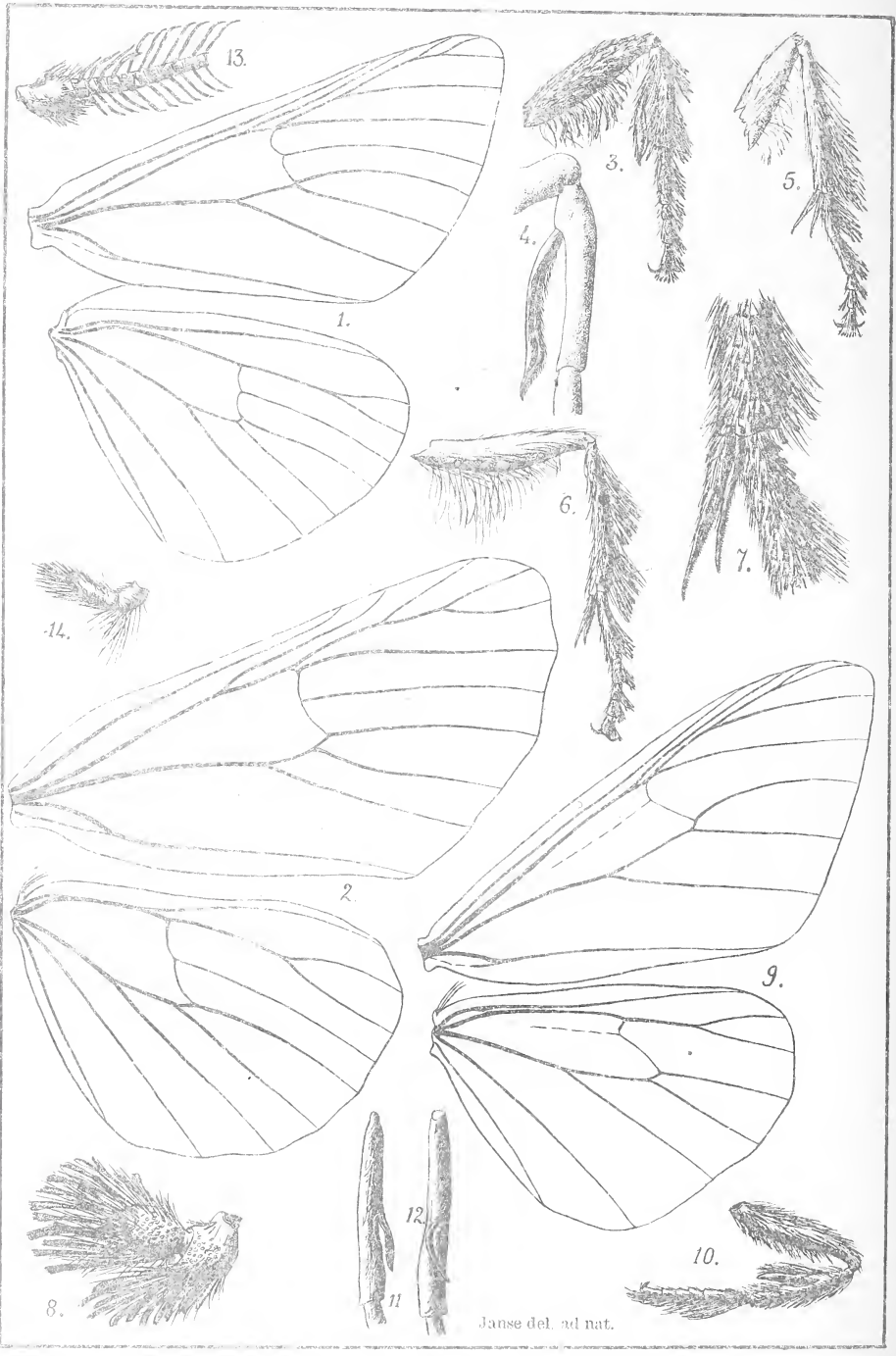


Plate XII.

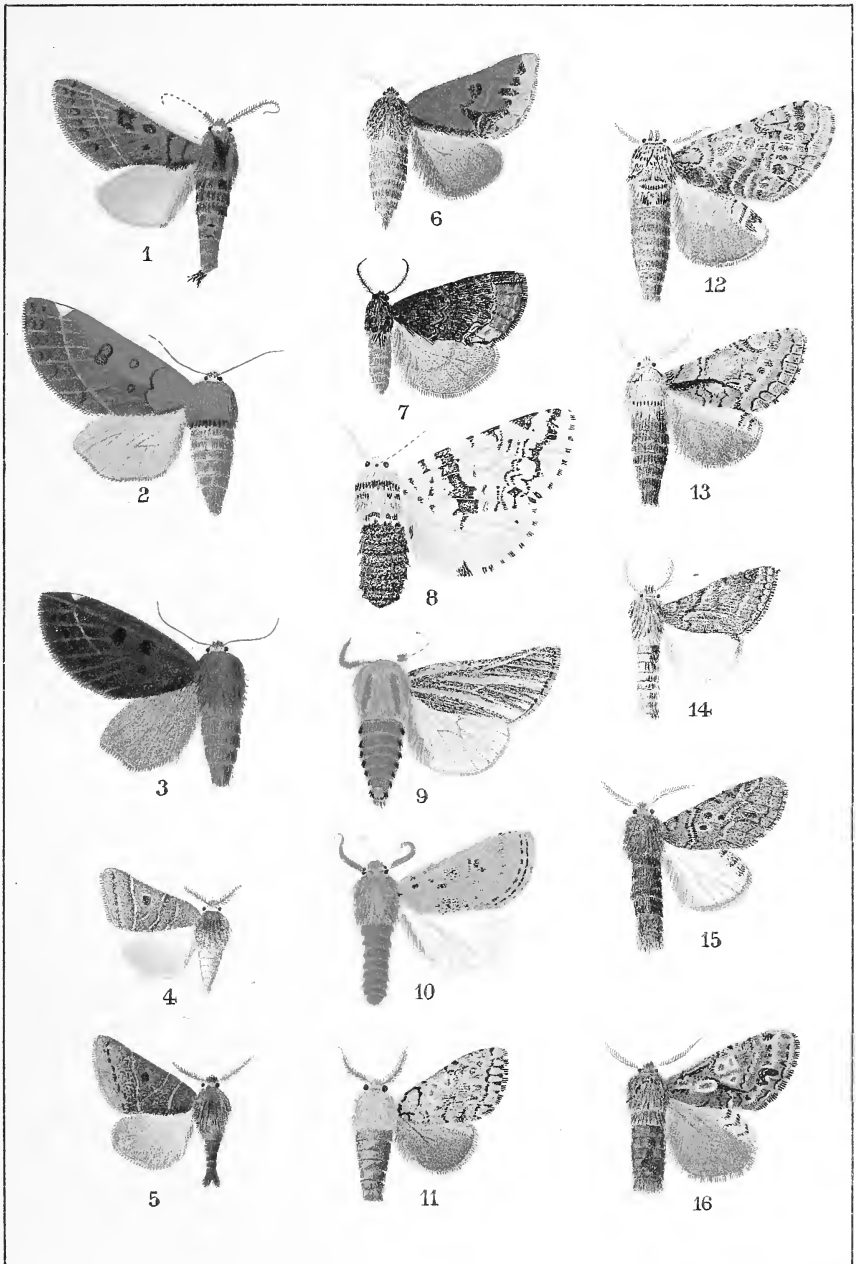
FIG. 1. Wings of *Anaphe reticulata* ♂ × 3.

FIGS. 2-8. *Polelassothis plumitarsus* ♂.—Fig. 2, wings of ♀ × 5 ; fig. 3, fore leg × 11 ; fig. 4, fore tibia (denuded) × 20 ; fig. 5, mid leg × 11 ; fig. 6, hind leg × 11 ; fig. 7, terminal spurs of hind tibia × 34 ; fig. 8, palpus × 34.

FIGS. 9-14. *Epanaphe clarilla* ♀.—Fig. 9, wings × 5 ; fig. 10, fore leg of ♂ × 5 ; fig. 11 fore tibia of ♀ seen from the outer side × 11 ; fig. 12, same turned one quarter ; fig. 13, basal part of antenna × 5 ; fig. 14, palpus × 11.

Plate XIII.

- Fig. 1. *Scalmicauda o'neili* spec. nov. ♂.
,, 2. *S. o'neili*, ♀.
,, 3. *S. o'neili* var. ♀.
,, 4. *Ichthyura roseotincta* spec. nov. ♂.
,, 5. *I. violacearia* spec. nov. ♂.
,, 6. *I. violacearia*, ♀.
,, 7. *Pectinophora noctuiformis* spec. nov. ♂.
,, 8. *Cerura bifasciata* spec. nov. ♀.
,, 9. *Antheua mixta* spec. nov. ♂.
,, 10. *A. dimorpha* spec. nov. ♂.
,, 11. *Desmeocraera varia* spec. nov. ♂.
,, 12. *D. varia* ♀.
,, 13. *D. varia* var. nov. ♂.
,, 14. *D. canescens* spec. nov. ♂.
,, 15. *D. tripuncta* spec. nov. ♂.
,, 16. *D. platti* spec. nov. ♂.



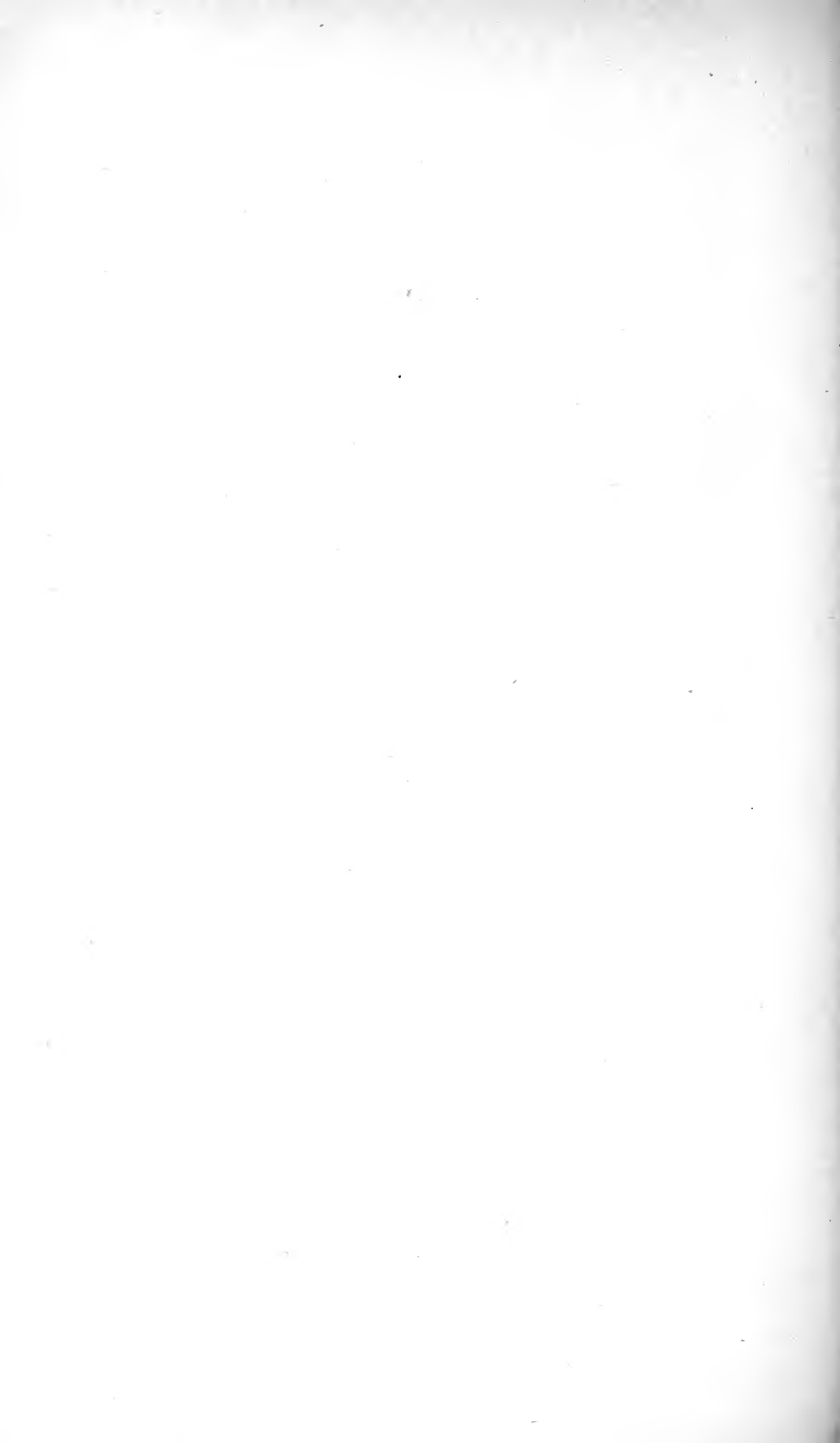
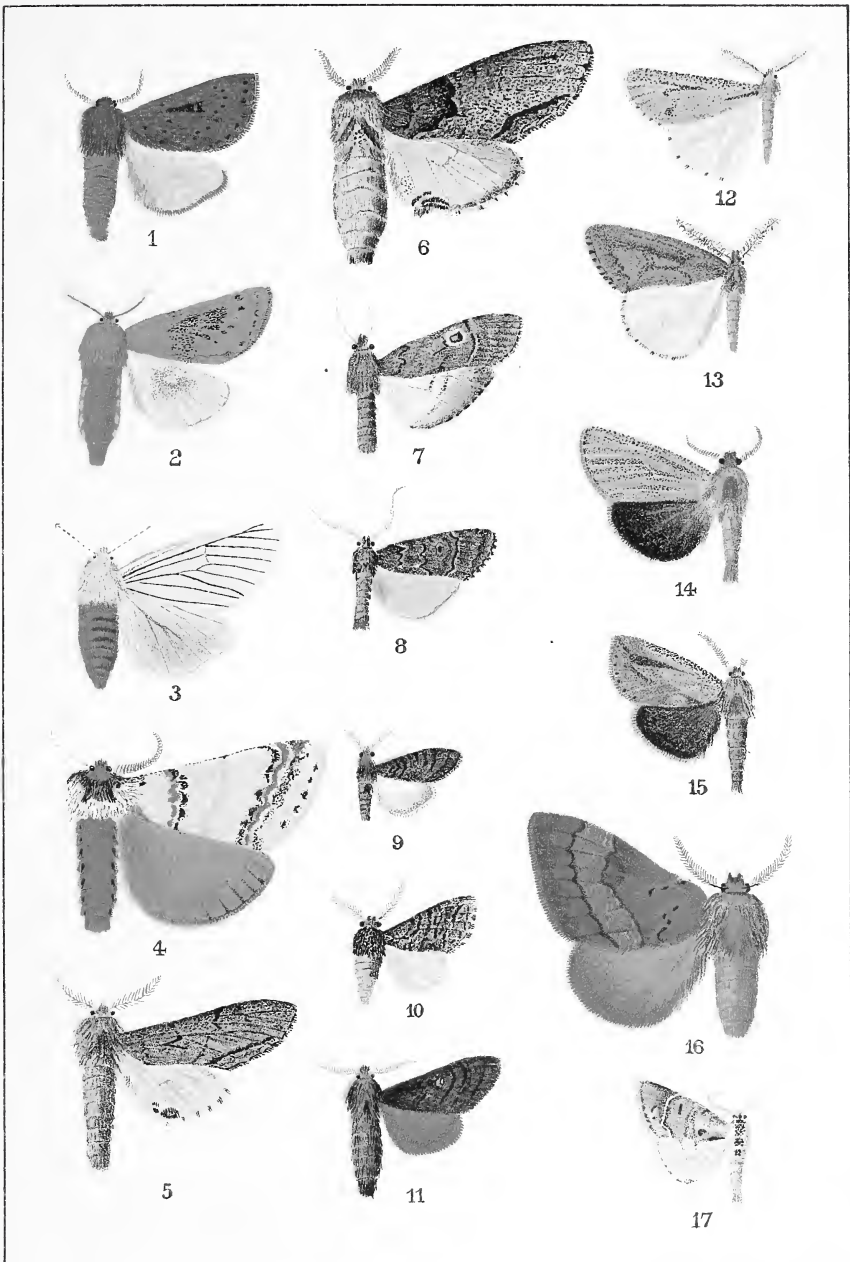


Plate XIV.

- Fig. 1. *Antheua dimorpha* var. *brunnea* nov. ♀.
,, 2. *A. dimorpha* spec. nov. ♀.
,, 3. *Hypophiala melanogramma* spec. nov. ♀.
,, 4. *Leucophalera elegans* spec. nov. ♂.
,, 5. *Hoplitis concolor* spec. nov. ♂.
,, 6. *H. concolor*, ♀.
,, 7. *Phycitimorpha congruata* spec. nov. ♂.
,, 8. *Ph. stigmatica* spec. nov. ♂.
,, 9. *Taeniopteryx cinerea* spec. nov. ♂.
,, 10. *Breyeria dasychiroides* spec. nov. ♂.
,, 11. *Eurystaura brunnea* spec. nov. ♂.
,, 12. *Crambometra derelicta* Prout ♂.
,, 13. *Campyloctys gladstonei* spec. nov. ♂.
,, 14. *Polienus nigrosarsa* spec. nov. ♂.
,, 15. *P. fuscata* spec. nov. ♂.
,, 16. *Prionocentrum o'neili* spec. nov. ♂.
,, 17. *Polelassothys plumitarsus* spec. nov. ♂.



ANNALS

MEDEDELINGEN

OF THE

VAN HET

TRANSVAAL MUSEUM

VOLUME VII

AUG - 2 1921



PART 4 containing

Descriptions of New Species of *Zonurus*, and Notes on the Species of *Zonurus* occurring in the Transvaal. By G. P. F. VAN DAM, Junior Assistant for Lower Vertebrates, Transvaal Museum. (With 4 plates.)

Description of a New Variety of a South African Lizard of the Family *Geckonidae*. By G. P. F. VAN DAM. (With 1 plate.)

The *Scolopendridae* of South Africa. By C. S. GROBBELAAR, Stellenbosch. (With 28 text-figures.)

Note on a Relic of the Phallus Cult among the M'Kahtla. By PERCY A. WAGNER. (With 1 plate.)

Issued June 1, 1921

PRINTED AT THE UNIVERSITY PRESS

CAMBRIDGE, ENGLAND

1921

ANNALS

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VOL. 7



DESCRIPTIONS OF NEW SPECIES OF *ZONURUS*,
AND NOTES ON THE SPECIES OF *ZONURUS*
OCCURRING IN THE TRANSVAAL

By G. P. F. VAN DAM, Junior Assistant for Lower Vertebrates,
Transvaal Museum.

With 4 plates.

Zonurus breyeri sp. nov. Plates I and II.

Description based on one holotype and three paratypes.

Head slightly longer than broad, strongly depressed. Head shields rugose; frontonasal about as broad as long, in contact with the rostral, separating the nasals, latter slightly swollen, nostrils in the posterior part of the nasal; praefrontals in contact with their inner angles; frontal hexagonal, slightly widened anteriorly; frontoparietals about as long as broad; interparietal between two pairs of parietals, being pointed anteriorly more sharply than posteriorly, in two specimens the interparietal touches the frontoparietals, in two other specimens it does not reach these shields, being separated from them by the first pair of parietals; posterior parietals larger than the anterior ones; six occipital spines, the outer ones largest and gradually getting smaller towards the middle, the middle pair very small; temporals large, keeled, five slightly curved irregular temporal spines on each side, the first or second lowest nearly as large or as large as the outer occipitals; four supraoculars, the anterior one longest, the second one broadest; four to five supraciliaries; lower eyelid opaque; loreal and praeocular large; four suborbitals; rostral twice and a half as broad as deep, five upper labials, fourth and fifth separated by a suborbital shield; six lower labials, fifth and sixth keeled, bordered below by four large shields and one small one; small irregular chin shields; gular scales small, obtusely keeled; larger irregular scales under the neck; sides of neck with irregular erect spines. Dorsal scales large, forming regular transverse series, hardly keeled in the middle but more and more towards the sides, spinose on the sides, 24-26 transverse series (from occiput to base of tail) of about 18 scales. Ventrals quadrangular, mostly broader than long, smooth, the outer ones slightly keeled, forming 10-12 longitudinal and 24-26 transverse series. A pair of feebly enlarged praeanal plates, with smaller ones in

front and on the sides. Limbs above with large spinose imbricate keeled scales; about 12 femoral pores on each side. Tail with whorls of large spinose scales, separated from each other by whorls of smaller scales; lateral caudal scales very large, strongly spinose and horizontal; lower caudal scales long, narrow, pentagonal, smooth. Colour: head, brownish-black above, much lighter and yellowish under the chin, back more brownish than head, becoming lighter towards the sides, which are yellowish-brown; belly, slate-grey becoming lighter and more tinged with brown towards neck and anus. Tail, greyish-brown above, lighter brown to yellowish on the sides, underneath slightly lighter than above.

In younger specimens several scales on the back and sides are nearly yellow, forming more or less transverse series from occiput to base of tail; several of the lateral caudal scales yellowish, and also some of the legs.

	millim.		millim.
Total length ...	275	Fore limb ...	41
Head ...	32	Hind limb...	60
Width of head ...	29	Tail ...	155
Body ...	88		

Holotype, a full-grown female, No. 3769, Cat. Lizards; paratypes, three nearly adult specimens, Nos. 3770, 3771, 3768, Cat. Lizards. Locality: Geelhoutkop (Driefontein), Waterberg Dist., Transvaal. Coll. by G. P. F. van Dam, and Dr H. G. Breyer, Jan. 1918.

This species is closely related to *Z. giganteus* Smith, from which it differs chiefly in size, number and length of the occipital spines. The tail with whorls of smaller scales separating the whorls of large spinose scales, these whorls of small scales being absent in *Z. giganteus*.

The new lizard occurs amongst rocks on the farm Geelhoutkop, about 45 miles north of Nylstroom. Geelhoutkop is the highest point in the vicinity (approximately 5000 ft.).

The holotype specimen is a large female. It was caught in Jan. 1918. On opening it was found to contain six young ones, of which five were preserved. Their length was as much as 90 mm. The unborn young differs from the adult in the following points: head shields smooth; occipitals not sharply pointed, but only keeled. Dorsal scales strongly keeled in the middle as well as on the sides. The whorls of small scales between the whorls of large spinose scales of the tail can be distinctly seen from above, but not from underneath, being hidden by the lateral spines and those below.

Zonurus barbertonensis sp. nov. Plate III.

Head longer than broad, strongly depressed. Head shields rugose; fronto-nasal slightly broader than long, in contact with the rostral, separating the nasals, latter slightly swollen, nostrils in the posterior part of the nasal; prae-frontals in contact at their inner angles; frontal hexagonal, slightly widened anteriorly; frontoparietals slightly broader than long; interparietal between four parietals, being pointed anteriorly more sharply than posteriorly; posterior parietals larger than the anterior ones; six occipital spines, the outer ones shorter than the second, second pair longest, narrowest, the middle pair shortest and broadest; temporals large, keeled, five temporal spines on each side; four supraoculars, the anterior one longest, the second one broadest; four supraciliaries; lower eyelid opaque; loreal and praeocular large; four to five suborbitals; rostral twice and a half as broad as deep, six upper labials, fourth and fifth separated by a suborbital shield; six lower labials, fifth and sixth keeled, bordered below by five large shields; small irregular chin shields;

gular scales small, larger irregular scales under the neck, sides of neck with irregular erect spines. Dorsal scales large, forming regular transverse series, keeled towards the middle, spinose on the sides, 30-32 transverse series (from occiput to base of tail) of 20 scales. Ventrals quadrangular, mostly broader than long, smooth, the outer ones slightly keeled, forming 14 longitudinal and 34-36 transverse series; a pair of feebly enlarged preanal plates, with smaller ones in front and on the sides. Limbs above with large spinose keeled scales; 10-12 femoral pores on each side. Tail with whorls of large spinose scales, separated from each other by whorls of smaller scales; lateral caudal scales large, strongly spinose, lower caudal scales long, narrow, pentagonal, slightly keeled. Colour: blackish above, with yellowish spots, forming more or less regular transverse series; belly, brownish with yellowish spots.

	millim.		millim.
Total length ...	312	Fore limb ...	43
Head ...	36	Hind limb...	64
Width of head ...	30	Tail ...	174
Body ...	102		

Type, one adult specimen from Barberton, Transvaal. Collected by G. P. F. van Dam, and A. Roberts, March, 1920.

This species differs from *Z. breyeri* and *Z. warreni*, in size of the occipital spines, and number of transverse series of dorsal scales.

The Transvaal Museum possesses also two young specimens from the same locality.

Zonurus robertsi sp. nov. Plate IV.

Description based on one holotype and one paratype.

Head depressed, triangular in shape, much longer than broad. Head shields slightly rugose; nasals not swollen, in contact with each other, pierced posteriorly; frontonasal hexagonal, about as long as broad, sometimes the posterior part is in contact with the frontal; praefrontals in contact at their inner angles, or separated by the anterior point of the frontal and the posterior part of the frontonasal; frontal hexagonal, the anterior point sometimes in contact with the frontonasal shield; frontoparietals about as long as broad, or slightly longer than broad; interparietal small, between two pairs of parietals; posterior parietals slightly larger than the anterior ones; neck much narrower than hind head, above, behind the head, covered with small irregular scales and granules; temporals large, in three longitudinal rows; four supraoculars; four to five supraciliaries; lower eyelid opaque; loreal and praecocular large, four suborbitals; rostral nearly three times as broad as high; 5-6 upper labials, fourth and fifth, or fifth and sixth, separated by a suborbital shield; 6-7 lower labials, bordered below by four large shields and one small one; irregular chin shields; gular scales small, those in the centre largest, and gradually getting smaller towards the sides; moderately large, irregularly arranged scales under the neck; sides of neck folded, granular; dorsal scales soft, and intermixed with small scales and granules, forming regular transverse series, the two median rows large, slightly rugose, quadrangular, and with a distinct keel, those towards the sides slightly rugose, quadrangular or pentagonal, about half the size of the two median rows, mostly distinctly keeled, the keel of the last row very distinct, in 12-14 longitudinal (counting over the middle of the back) and 42-46 transverse series (from middle of neck to base of tail); sides of body covered with very small roundish scales and granules; ventrals large, broader than long, square, smooth, juxtaposed, forming eight

longitudinal and 26–28 transverse series; a pair of enlarged praeanal plates, with smaller ones in front and on the sides. Limbs above covered with imbricate keeled scales; 16–18 femoral pores on each side. Tail with whorls of strongly keeled scales, lateral caudal scales spinose, lower caudal scales long, narrow, quadrangular, those near the anus smooth, but more and more strongly keeled towards the tip of the tail. Colour: dark brown above, some of the scales with yellowish spots; belly and head below, dark grey.

	millim.		millim.
Total length	... 267	Fore limb	... 41
Head	... 30	Hind limb	... 66
Width of head	... 21	Tail	... 169
Body	... 68		

Holotype, a full-grown specimen, No. 3747, Cat. Lizards; paratype, a nearly adult specimen, No. 3748, Cat. Lizards.

This species is closely related to *Z. capensis* Smith; from which it differs chiefly in the number and size of dorsal scales. Locality: Klaver, van Rhynsdorp Dist., C.P. Collected by Messrs A. Roberts and A. A. Adendorff, Sept. 1917.

The Transvaal Museum possesses also five young and nearly full-grown specimens from the same locality.

The genus *Zonurus* is represented by three species in the Transvaal, besides the two species described above, namely:

1. *Zonurus giganteus* Smith. We have the species from near Paardekop Station (Standerton Dist., Transvaal), Zandspruit near Wakkerstroom (Transvaal), Schaapplaats (Vereeniging), Kroonstad, Bloemfontein.

2. *Zonurus vittifer* is common in the immediate neighbourhood of Pretoria, but only on rocky kopjes, where it lives in rock crevices and under stones. In our collection we have specimens from the following localities:

Pretoria and Dist., Zuurfontein near Johannesburg, Orange Grove near Johannesburg, Frederikstad, Townkloof (Rustenburg), Groenkloof (Rustenburg Dist.), Doornkop (Witpoort, via Belfast), Wakkerstroom, Weenen (Natal), Arnheemburg (Carolina), Woodbush, Shilowane, Metlepetsi Riv. (Zoutpansberg Dist.), near Makapans Caves (Potgietersrust), Selati, Haenertsburg (Zoutpansberg Dist.).

This species is wrongly placed as a synonym of *Z. cordylus* in Mr Boulenger's list, published in the *Ann. S. African Mus.* vol. v. part ix. p. 468. It differs from *Z. cordylus* as known to me from the Cape, Grahamstown, Paarl, Port Elizabeth, East London C.P., constantly in various points. In order to make sure, I carefully inspected all our specimens of these species, 65 *Z. vittifer* and 60 *Z. cordylus*, and am now able to show these differences in the following table:

<i>Zonurus vittifer</i> Reich.	<i>Zonurus cordylus</i> Linn.
Frontonasal shield usually of irregular size or absent.	Frontonasal shield usually large.
Scales of the second row immediately posterior to the parietals regular longitudinal elongated, followed by rows of shorter shields.	No such regular large shields.
Dorsal shields, 22–24 longitudinal series, 20–25 transverse series from occiput to base of tail.	Dorsal shields, 16–18 longitudinal series, 26–28 transverse series from occiput to base of tail.
Ventral shields in 14–16 longitudinal rows.	Ventral shields in 10–14 longitudinal rows.

In *Z. vittifer* the second row of shields immediately posterior to the parietals, which looks more or less like a collar, distinguishes the two species at once.

A related form from Barberton has been described by Boulenger as *Z. tropidogaster*. After examining a large series of *Z. vittifer* Reich. from various localities in the Transvaal, also one young and one nearly adult specimen from the type locality of *Z. tropidogaster* (Barberton), I am inclined to agree with Hewitt that this is only a form of *Z. vittifer* (see *Ann. Transvaal Mus.* vol. III. No. 1, p. 47, April, 1911). The frontonasal shield in *Z. vittifer* in our large series is of irregular size, large, very small, or absent; in three specimens from Wakkerstroom the frontonasal shield is absent, and in another three specimens from the same locality present. The character of the frontonasal shield proves therefore not to be constant in *Z. vittifer*; in other respects *Z. tropidogaster* agrees well with the description of *Z. vittifer*, and as the distinction of *Z. tropidogaster* seems to depend upon the character of the frontonasal, this supposed species does not appear to be valid and is a synonym of *Z. vittifer*, which Boulenger has wrongly placed as a synonym of *Z. cordylus*.

3. *Zonurus jonesi* Blgr. is represented in our collection from the following localities:

Lydenburg, Leydsdorp, Griffin Mine near Leydsdorp, Makoutsi Riv. about 28 miles S.S.W. of Leydsdorp, Maiepo about 25 miles N. of Gravelotte, Shiny about 28 miles E. of Gravelotte (Ward Low Country), Silwane (Ward Low Country), Selati, Hectorspruit, Pongola Riv. (Waterberg Dist.), Geelhoutkop (Waterberg Dist.), Bridge Water (Rustenburg Dist.), Hornsnek (Pretoria Dist.), Mazambo (Portuguese S.E. Africa), near Lundi Riv. (S.E. Rhodesia). The Griffin Mine specimens have been found by me; they were taken from under the bark of a dead tree and from the hollow trunk of a living tree, both standing in cultivated lands.

DESCRIPTION OF A NEW VARIETY OF A SOUTH AFRICAN LIZARD OF THE FAMILY *GECKONIDAE*

By G. P. F. VAN DAM.

With 1 plate.

Pachydactylus capensis Smith var. nov. *tigrinus*. Plate V.

Head oviform, distinct from neck, snout a little longer than the diameter of the orbit. Ear-opening oval, oblique. Body depressed. Limbs moderate; digits short, slender, but broader at the end than the base, the dilated terminal part with four lamellae inferiorly. Tail depressed, the basal portion annulate, thick in its basal half, thinning in the terminal half, which becomes finely pointed. Snout covered with convex, slightly keeled scales, which are about as large as those on the back; hind part of head covered with small slightly keeled granules; neck behind the head covered with small granules and larger subconical tubercles; naso-rostrals in contact, rostral broader than high; 8-9 upper labials and 6-7 lower labials. Back with irregularly arranged various sized, slightly imbricate and slightly keeled scales, granules absent or only a very few scattered ones present; abdominal scales moderate, smooth, increasing in size from throat to groin. Upper surface and sides of tail with imbricate slightly keeled scales; lower surface of tail with imbricate smooth scales. Colour: greyish-brown and blackish-brown above, with six well-defined whitish (yellowish when alive) narrow transverse bands on the back as follows: one behind the head, one between the shoulders, two over the body, one in front of the hind legs, one near the base of tail, sometimes the band in front of the hind legs is broken up into spots; a dark brown or blackish streak on the sides of the head, passing through the eye, supraciliaries yellowish; sides of head and body, upper parts of legs, and tail spotted with white or yellowish.

Types, eight specimens T. M. Cat. Lizards, Nos. 4301-4308, in the Transvaal Museum. They were taken amongst rocks at Brak Riv. (Blinkwater), Zoutpansberg Dist., N. Transvaal, by G. P. F. van Dam, June, 1920.

The Transvaal Museum also possesses another 27 specimens from N'jelele Riv., Zoutpansberg Dist., N. Transvaal.

		millim.			millim.
Total length	...	92	Fore limb	...	15
Head	...	13	Hind limb	...	19
Width of head	...	10	Tail	...	40
Body	...	39			

This variety is closely related to *P. capensis* var. *formosus* (see *Ann. Transvaal Mus.* vol. iv. No. 3, p. 135), from which it differs in having the dorsal scales slightly keeled, instead of being very strongly keeled; they also differ in colour and markings.

THE SCOLOPENDRIDAE OF SOUTH AFRICA

By C. S. GROBBELAAR, Stellenbosch.

With 28 Text figures.

Introduction.

I HAVE undertaken the specific determination of the South African *Scolopendridae* in order to bring this apparently neglected group on a level with those leading Arthropodan divisions that have received considerable attention in the past from leading authorities. The interested reader will notice that not a single new genus or species has been established. Here and there I have been tempted to establish a new species; but the range of variation in a single species is so considerable in the *Scolopendridae* that I have thought it advisable to adhere to the determination of the previous workers on the group. Kraepelin, who recognised this phenomenon only too clearly, made provision for it in his diagnoses of the species. He, more than anybody else, is responsible for the systematic work on our South African *Scolopendridae*.

I am deeply indebted to the Director of the Transvaal Museum, Pretoria, and Mr John Hewitt, Director of the Albany Museum, Grahamstown, for placing their entire collections of *Scolopendridae* at my disposal. I am specially grateful to Mr John Hewitt for the many suggestions he proposed and which have been given effect to in preparing the manuscript.

Probably four-fifths of the South African Chilopoda are included in the family *Scolopendridae*. In his monograph: *Myriopoda Africae Australis, in Museo Regio Holmiensi asservata, recensuit 1871*, C. O. von Porath founded a new genus and several new species of Scolopendrids. His monograph is the first definite contribution to our knowledge of the South African Chilopoda. In it were recorded and described *Scutigera capensis* Templeton, and *Scutigera rugosa* Newport; a new species *Henicops africana* of the *Lithobiidae*; and several new species of Scolopendrids belonging to the genera *Scolopendra*, *Cormocephalus*, *Eucorybus*, *Heterostoma* and *Trematoptychus* were described. The genera *Heterostoma* Newport and *Dacetum* C. L. Koch have been included in the single genus.

Ethmostigmus Pocock; *Eucorybus* Lucas has been supplanted by *Alipes* Imhoff; and *Trematoptychus* Peters by *Rhysida* Wood.

Pocock raises the Scolopendrids to the order Scolopendromorpha, in which all the eyebearing forms are placed in the family *Scolopendridae*, with two sub-families, *Alipinae* and *Scolopendrinae*. The forms without eyes are referred to several families; the most important of these are the three families *Cryptopidae*, *Scolocryptopidae* and *Newportiidae*. These three families are included in Kraepelin's sub-family, the *Cryptopinae*. Kraepelin regards *Cryptops* as the least specialised form, and, in virtue of the following characters, uses it as a basis of classification. The characters are: uni-segmented tarsals; absence of eyes; slight differentiation of the segments of the antennae; nature of the pleurae; armour of the anal legs. He divides the Scolopendrids into the three sub-families:

1. *Cryptopinae*.
2. *Otostigminae*.
3. *Scolopendrinae*.

His classification is founded on:

- (a) The presence or absence of eyes.
- (b) The nature of the stigmata.
- (c) The division or non-division of the tarsals.
- (d) The presence or absence of longitudinal grooves (sulci) on the scuta and terga.

It is on this classification that the Chilopoda from the Transvaal Museum, Pretoria, and the Albany Museum, Grahamstown, placed at my disposal, have been specially determined. No members of the *Cryptopinae* have thus far been found in South Africa.

The principal literature consulted was:

Kraepelin's "Revision der Scolopendriden" from *Mitteilungen aus dem Naturhistorischen Museum*, vol. xx. 1903 (2 Beiheft zum *Jahrbuch der Hamburgischen Wissenschaftlichen Anstalten*, xx.);

and for original descriptions of species:

Myriopoda Africae Australis, in *Museo Regio Holmiensi asservata, recensuit 1871*, by C. O. von Porath.

The *Scolopendridae* are divided into the three sub-families *Cryptopinae*, *Otostigminae* and *Scolopendrinae*.

The following is a key to the *Otostigminae* and *Scolopendrinae*, the two sub-families represented in South Africa.

- A. Four eyes on each side of the head. The tibia of the walking legs followed by a proximal and distal tarsus; these form an angle at the point of contact. The tibia of the walking legs (except the first) are not provided with spines or spurs on the under surface, and they have no spine on the distal extremity
 - a 1. Opening of stigmata rounded, oval or nearly circular, shallow or sunken into body-wall, placed obliquely to the longitudinal axis of body, and almost perpendicular to axis in the posterior somites; on contraction it closes antero-posteriorly. Head-plate does not extend over the first tergite; basal plates and longitudinal sulci absent . . . **Otostigminae**
 - a 2. Opening of stigmata acute-angled anteriorly, from short triangle-shaped to long trianguliform or narrow, slit-like placed parallel to the longitudinal axis of the body, and contracts dorso-ventrally. Tarsal spurs absent or only represented by single spines. Head-plate often extends over anterior margin of first tergite or provided with basal plates and two median sulci **Scolopendrinae**

Sub-family OTOSTIGMINAE.

Key to the South African genera

(adapted and slightly modified from Kraepelin's *Revision der Scolopendriden*).

- 1. Only nine stigmata developed (seventh segment without stigmata).
 - Only first to second seldom first to third segments of antennae naked **2**
 - Ten stigmata developed (eighth segment without stigmata). Always first three or first four segments of antennae naked **3**
- 2. Anal legs have the normal shape, provided with terminal claws. The tergites are seldom carinated and coarsely punctured
 - Otostigmus** Porath (not represented in S. Africa)
 - Anal legs have the last three segments (tibia, proximal and distal tarsals) laterally compressed to form a wide oar-shaped or racket-shaped plate (see fig. 2) without terminal claws. Tergites always carinated, and generally coarsely punctured **Alipes** Imhoff

3. Sternocoxal plate (maxillary sternite) provided with distinct prosternal dentiferous plates. The pleurae end in a process with spines. Tergites not provided with broad elevated ridges and deep impressions, they are smooth and bisulcate. Sternites bisulcate or without sulci. Only first three or first four segments of antennae are naked 4
4. Femur of maxillipede provided with well-developed basal tooth extending beyond the prosternal plates. Generally the first three (very seldom the first four) segments of antennae naked. Stigmata deepened, surrounded by a prominent wall that inclines to the inside, the stigmata wall seldom flattened **Rhysida** Wood
- Femur of maxillipede not provided with a basal tooth extending beyond the prosternal plates, at most a dwindling rugosity is present. Only first four segments of antennae are naked. Stigmata large, the first is exceptionally large, they are flat-bottomed. The pleurae usually end in a long process **Ethmostigmus** Pocock

Genus *ALIPES* Imhoff.

(See figs. 1 and 2.)

Alipes crotalus Gerst. Antennae 17 segments, $2\frac{1}{3}$ basal segments naked. The two longitudinal and the median carinations of the tergites begin on the third somite with broad shallow ridges richly covered with fine, short, hairy setae. Marginations begin from the fifth or sixth tergite. Lateral depressions are partly developed, densely and finely punctured. The carinations are densely

Fig. 1. Pleura and anal somite of *Alipes crotalus* Gerst.Fig. 2. Anal leg of *Alipes crotalus* Gerst. f = femur; p = patella; t = tibia; t_1 = proximal tarsus; t_2 = distal tarsus.

punctured and finely granulated; anal tergite finely punctured with a distinct median depression. Sternocoxal plate (maxillary sternite) sparsely punctured, with abbreviated anterior sulcus; prosternal plates about as long as broad, each bearing four teeth. The sternites are smooth, without median sulci, but often with two lateral depressions and on the posterior edge a median depression; anal sternite abbreviated, posterior margin rounded. Posterior margin of pleurae curved, almost rectangular. Femur of anal legs coarsely punctured dorsally, without a basal process or tooth-like prominence; tibia a little longer than the breadth (measured from point to point) of the posterior margin; first tarsus about $\frac{1}{2}$ broader than the posterior margin of tibia (5.5 : 4.5 mm.), $1\frac{1}{2}$ times as long as broad, studded with flattened oval rugosities. Colour yellowish brown to reddish brown; the head-plate often redder. Length up to 64 mm. with breadth 5 mm.

The description of this species is largely taken from Kraepelin, *loc. cit.* The specimens are from: Hectorspruit (Tvl.); Newington, near Komatipoort (Tvl.); Natal (Miss H. Becker); and Selati.

The genus is only represented by the single species in South Africa. It is very uncommon, and seems to be confined to the north-eastern regions of South Africa.

The following species (Kraepelin, *loc. cit.*) should be noted:

- A. appendiculatus* Poc.: Nyasaland, Zambesi.
A. calcipes Cook: South-West Africa (Quango, Angola).
A. multicostis Imh.: West Africa (Cameroon, Mundave, Sierra Leone, and Gold Coast, Elephantensu).
A. grandidieri Luc.: East Africa (Zanzibar and East Afr. Protectorate (formerly German East Africa)).

Genus ETHMOSTIGMUS Pocock.

(See figs. 3 and 4.)

Key to *Ethmostigmus trigonopodus* Leach.

Sternocoxal plate (maxillary sternite) provided with four equal, or nearly equal, stout teeth. Penultimate walking leg generally provided with a tarsal spur.

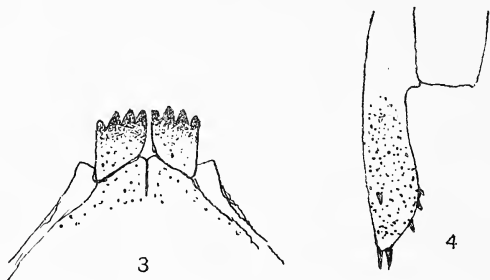


Fig. 3. Maxillary sternite (or sternocoxal plate) and prosteral dentiferous plates of *Ethmostigmus trigonopodus* Leach.

Fig. 4. Pleura and armature of *Ethmostigmus trigonopodus* Leach.

Femur of anal legs ventral exterior with 3 (2), ventral interior with 2 (3) spines, dorsal with 2, 2 spines and terminal spine.

The bifid termination of the pleurae have the shape of two short stout needles; *pleurae* armed dorsally with 2-3 spines, laterally with 1-2 spines, the anal sternite does not extend up to the pleurae.

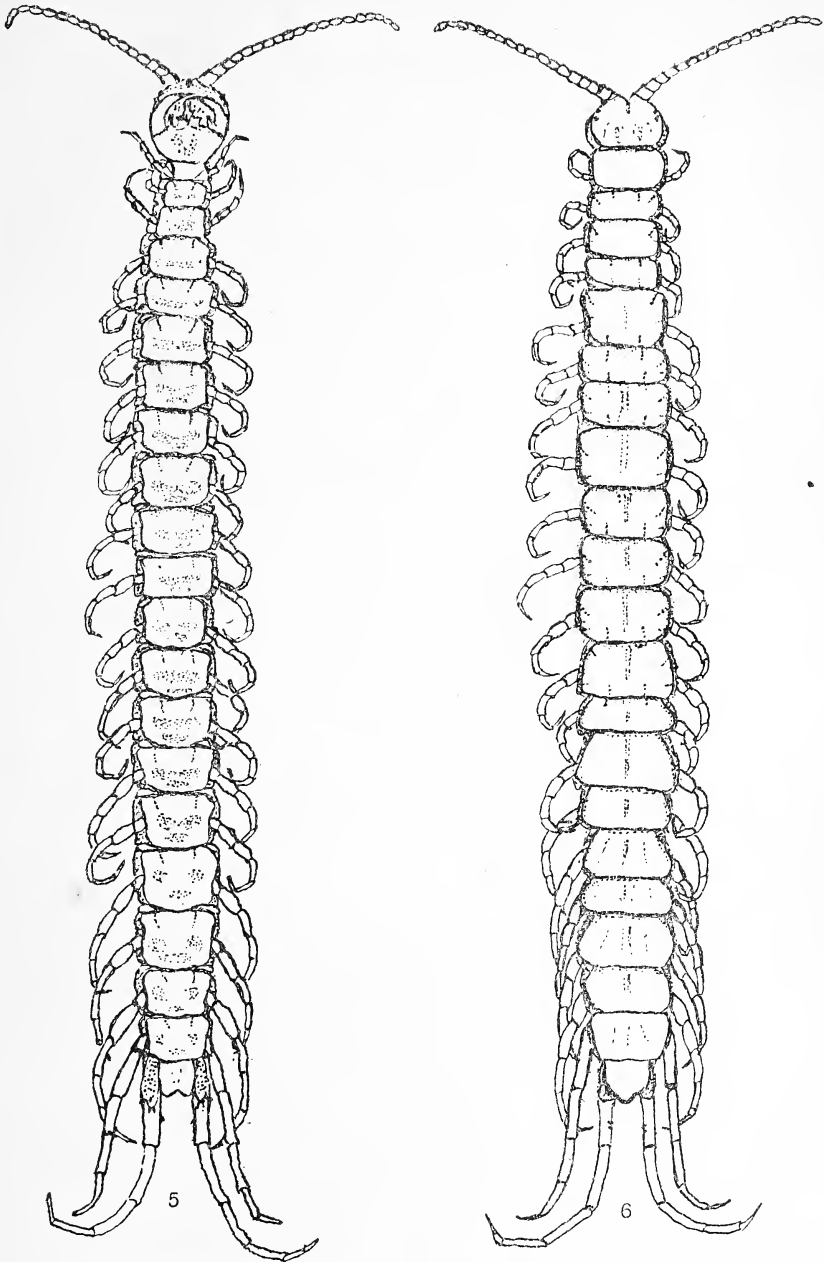
Habitat: "Durch ganz Afrika von Algier und Abyssinien bis zum Kaplande, am häufigsten aber im tropischen Afrika, sowohl an der West- wie an der Ost-Küste" (Kraepelin, *loc. cit.*).

The museum specimens were from: Leydsdorp (Tvl.); Hectorspruit (Tvl.); Malelane (Tvl.); Vygeboompoort, Waterberg (Tvl.) (G. van Dam); Victoria Falls; Shoholle, near Gravelotte Railway Station (G. P. F. van Dam).

Genus RHYSIDA Wood.

Key to the South African species.

1. Tergites without median sulci, at most a pair of short median lines is present on the posterior margin. Sternites with a pair of faint, abbreviated sulci, and often two shallow impressions. Anal tergite margin-

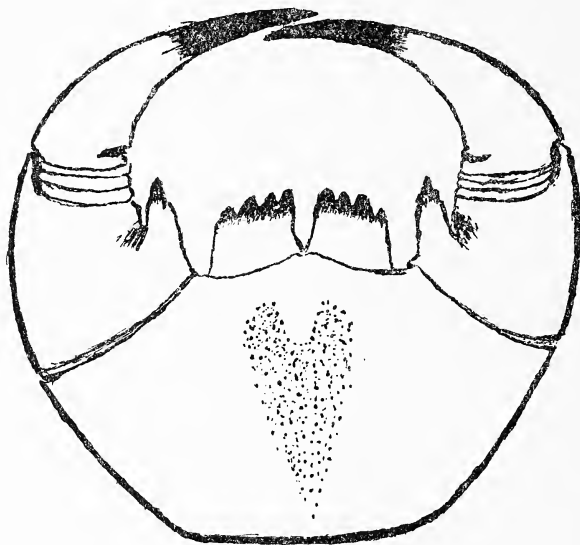


Figs. 5 and 6. *Rhysida afra* Peters. 5, ventral view; 6, dorsal view.

- ate. Posterior boundary line of the prosternal dentiferous plates meet in an obtuse angle. Anal sternite abbreviated, posteriorly angularly or curved emarginate. Femur of anal legs armed ventrally with a few spines. Pleurae with bifid extremity; exterior margin or porous area deeply emarginate. Nineteenth pair of legs with one tarsal spur, twentieth without. First stigmata (when closed) σ -shaped (see fig. 12); second often σ -shaped 2
2. Pleurae provided laterally with a spine, and strong bifid termination. Femur of anal legs armed with an aggregate ventrally and internally with 3-4 spines (see fig. 11) **R. afra** Peters
 Pleurae without lateral spine, weak bifid termination. Femur of anal legs unarmed or at most one or two small spines **R. petersi** Porath

1. *Rhysida afra* Peters. (Figs. 5, 6.)

Habitat: Delagoa Bay; Haenertsburg, Waterberg (Tvl.); Alicedale (C. Prov.); Belfast (Natal); Sunnyside, Pretoria (B. Penfold, Esq.); Wakkerstroom (Tvl.) (M. Hazellhurst); Rustenburg (Tvl.) (J. H. van Dam); Sjambockstad, Pretoria (F. C. Zwarts); Avontuur (C. Prov.) (J. H. Rex); Vygeboompoort (Tvl.) (G. van Dam); Roodepoort Dist., Pretoria (G. P. F. van Dam); Nylstroom, Waterberg (G. P. F. van Dam).



7

Fig. 7. Sternocoxal plate (maxillary sternite) and maxillipedes of *Rhysida afra* Peters.

2. *Rhysida petersi* Porath.

Habitat: Port Elizabeth and neighbourhood; Giant's Castle, Tabamlope, (Natal); Haenertsburg, Zoutpansb. distr. (Mr Swierstra); Wakkerstroom (Tvl.) (Mr A. Roberts); Grahamstown (C. Prov.) (G. P. F. van Dam).

The two species *R. afra* and *R. petersi* are usually if not invariably found in the same locality, and they are in most characters so alike that they appear to be one and the same species. It is, however, advisable to adhere to the two

species; I found a tibial spur present on 1-11 legs, 1-4(-5) legs and on 1-9 legs in *R. petersi*. Porath says of *R. petersi*: "paria 1-3 (num plures?) praeterea articulo antepenultimo spinula 1."

He tabulates the differences between the two species as follows:

<i>Rhysida petersi</i> .	<i>Rhysida afra</i> .
Anal legs comparatively longer.	Anal legs are comparatively shorter; a little more than 14 mm., against a body length of 55 mm.
The lower side of anal legs provided with only <i>one</i> spine.	The lower side of anal legs provided with two spines. (There may be from three to four spines on femur of anal legs. C. S. Grobbelaar.)
Pleurae generally without lateral spine.	Pleurae generally provided with a lateral spine.
Scuta faintly but clearly punctured (pointed).	The dorsal segments of the body appear smooth (Peters).
The penultimate pair of legs a little shorter than anal legs, and the difference between them and the antepenultimate is greater than between the same and the anal legs.	The penultimate pair of legs agree much more with the antepenultimate than with the anal legs.
Colour of legs lighter.	Legs a little lighter than colour of the body.

I ascertained the following difference:

Mandible with five teeth (fig. 10).	Mandible with four teeth (figs. 8, 9).
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Sub-family SCOLOPENDRINAE.

Key to the South African genera

(adapted from Kraepelin, *loc. cit.*).

1. Proximal tarsus of the legs clearly longer than the distal. Twenty-one somites 2
2. Pleurae non-porous, smooth, almost covered by the anal sternite (fig. 13) of the anal somite, abbreviated, without trace of a process. Antennae very short, at most reaching to the end of the first tergite 3
Pleurae distinctly porous, free, always provided with a process carrying one, two or more spines. Antennae longer, always extending beyond the first tergite 4
3. Head-plate not overlapped posteriorly by the first tergite, free. Four eyes flush with the surface. Second shorter than the first. Antennae extend to the end of the first tergite **Asanada** Meinert
4. First tergite usually without a pair of complete median sulci. Claws of anal legs seldom longer or as long as the distal tarsus, the under side usually concave measured from the base (cf. however, *Arthrorhabdus*). Stigmata usually elongate 5
5. All walking legs without tarsal spurs 6
All walking legs (exc. the last) with tarsal spurs 10
6. Process of pleura armed with many spines at the end (multi-pointed); head-plate usually overlaps first tergite, seldom overlapped by it 7
Process of pleura ends in a single spine, mostly in two spines or bifid and seldom in three, or entirely without spines. Posterior margin of head-plate usually overlapped by first tergite (Old-World) 8
7. Head-plate with distinct basal plates at base. Pleurae short, cylindrical. Segments of antennae all shorter than broad

Hemicormocephalus Kraepelin

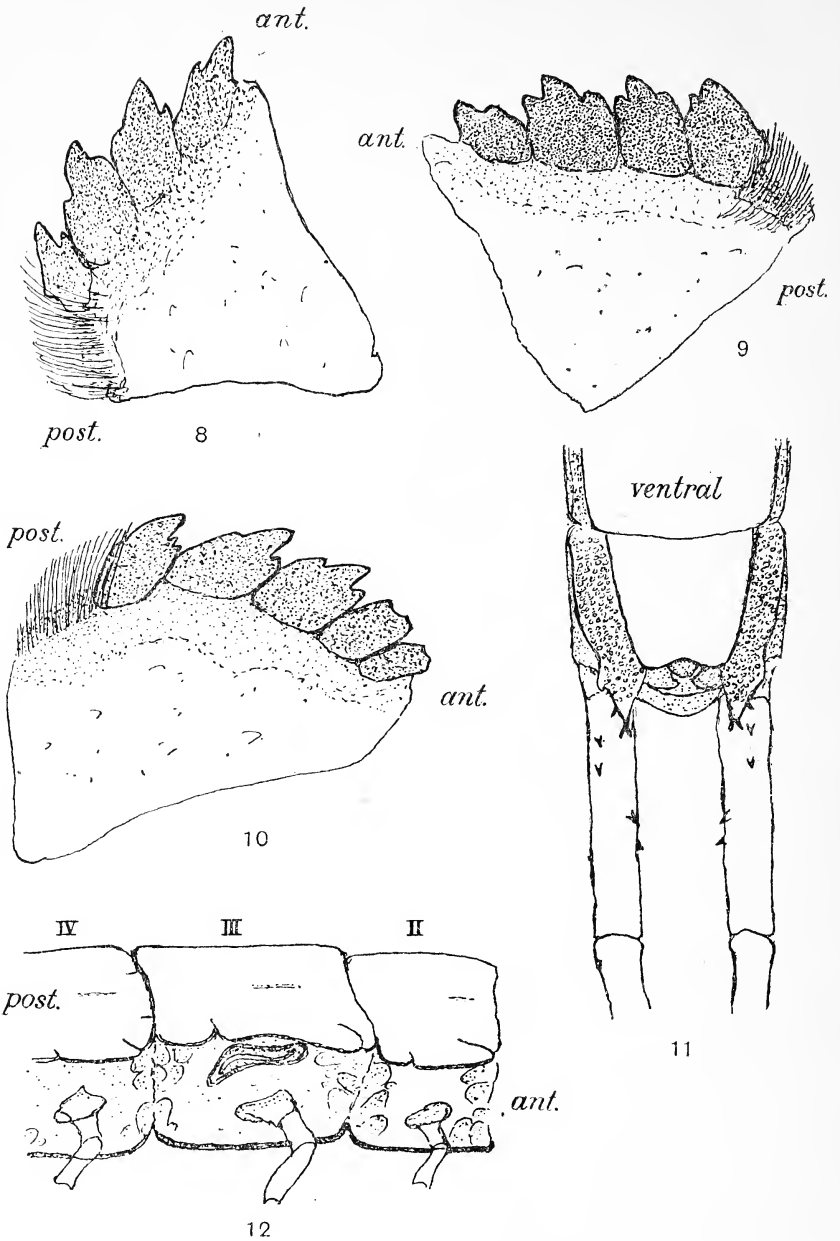


Fig. 8. Mandible (from the outside). *R. afra* Peters.

Fig. 9. Mandible (from the inside). *R. afra* Peters.

Fig. 10. Mandible (from the inside). *R. petersi* Porath.

Fig. 11. Anal somite, pleurae and femur of anal legs (ventral). *R. afra* Peters.

Fig. 12. 2nd, 3rd and 4th somites (lateral) to illustrate the U-shaped opening of the first stigmata. *R. afra* Peters.

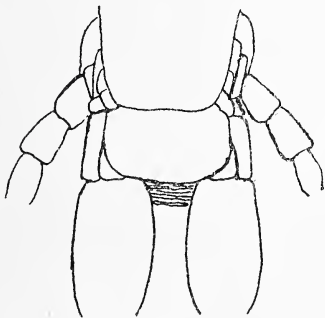
8. Anterior margin of first tergite overlaps posterior margin of head-plate, the head-plate and first tergite seldom just meet each other. Process of pleura bifid or trifid (three-pointed) or unarmed. Head-plate usually with a pair of median sulci, and basal plates 9
9. Process of pleura without spines. Femur of anal legs unarmed or nearly so **Colobopleurus** Kraepelin
Process of pleura bifid, seldom trifid; femur of anal legs armed
Cormocephalus Newport
10. Head-plate meets the first tergite in a transverse sulcus, it does not end freely. Tergites bisulcate from second somite
Trachycormocephalus Kraepelin
Head-plate ends freely, overlaps or just meets the first tergite. Tergites usually not bisulcate from the second tergite 11
11. Claws of anal legs without spurs. Head-plate, with posterior margin free, just meets the first tergite, scarcely or not at all overlapping it
Arthrorhabdus Pocock
Claws of anal legs always provided with spurs. Head-plate clearly overlaps the anterior margin of first tergite **Scolopendra** Linné

Genus *ASANADA* Meinert.

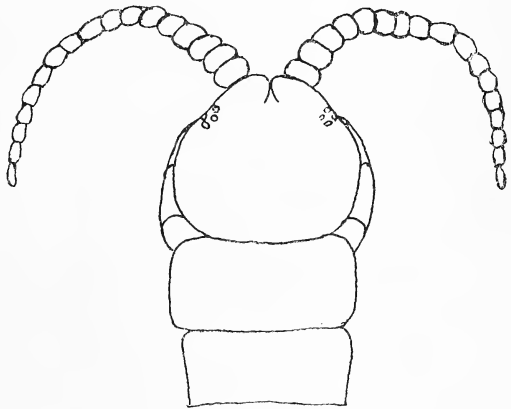
Asanada socotrana Pocock. (Figs. 13, 14.)

Habitat: Serowe (Bechuanaland); Shoholle, near Gravelotte Railway Station (Tvl.) (G. van Dam).

It is of interest to note that it is the first time this genus has been recovered in South Africa. One specimen from Serowe (Bechuanaland), is in possession of the Albany Museum; the other from Shoholle, near Gravelotte Railway Station (Tvl.), is in the possession of the Transvaal Museum, Pretoria.



13



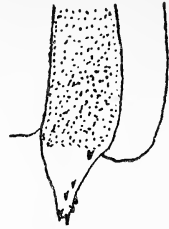
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Fig. 13. Anal somite, pleurae and femur of anal legs (ventral) of *Asanada socotrana*. (From *Revision der Scolopendriden*, Kraep.) The pleurae almost covered by the anal sternite.

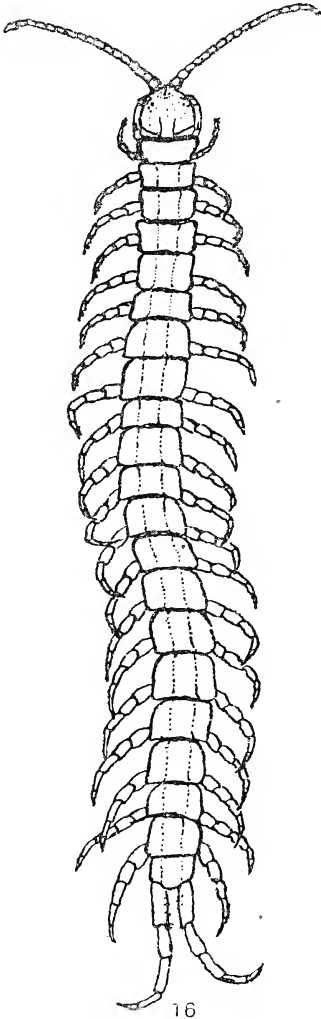
Fig. 14. Head, 1st and 2nd somites (dorsal) of *Asanada socotrana* Meinert. (From *Revision der Scolopendriden*, Kraep.)

Fig. 15.

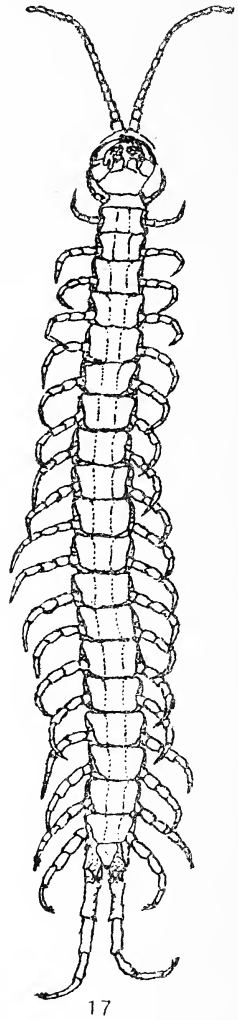
Pleura and armature of *Hemicormocephalus multispinus* Kraepelin. (From *Revision der Scolopendriden*, Kraepelin.)



15



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17

Figs. 16 and 17. *Cormocephalus nitidus* Porath. 16, dorsal; 17, ventral.

Genus *HEMICORMOCEPHALUS* Kraepelin.*Hemicormocephalus multispinus*. (Fig. 15.)

This genus instituted by Kraepelin contains only the one species. He founded the species on a specimen from Durban. I have found the same species from Mganduli (Natal); one labelled G.C.G.R. Natal, R. E. Symons; L. Tugela (Natal) (R. E. Symons).

Genus *TRACHYCORMOCEPHALUS* Kraepelin.*Trachycormocephalus* sp.? from Worcester Mine, Barberton (Tvl.).Genus *CORMOCEPHALUS* Newport.*Cormocephalus nitidus* Porath. (Figs. 16, 17, 18 and 19.)

Habitat: Port Elizabeth; Alicedale; Barberton (Tvl.); Sabi (by J. Flygare); Wakkerstroom (Tvl.); Drakensbergen (Natal) (R. E. Symons); Grahamstown (G. P. F. van Dam).

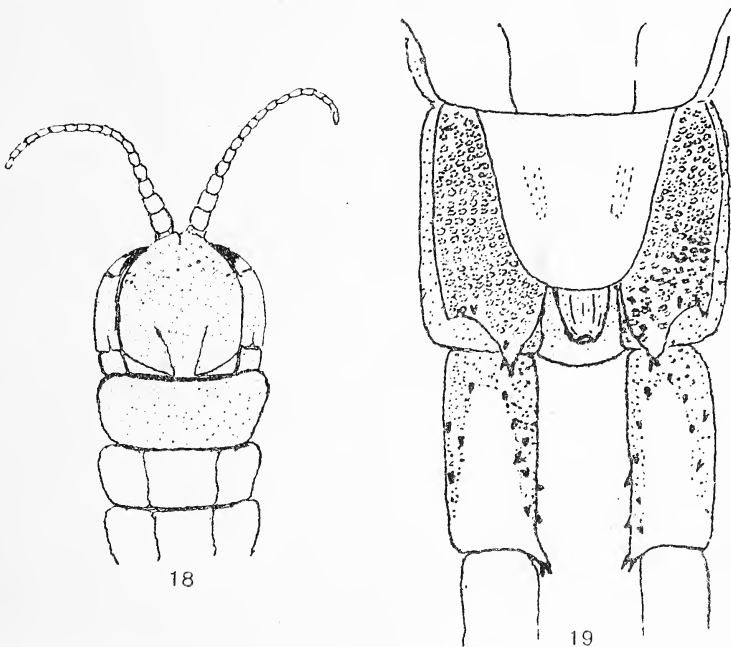


Fig. 18. Head-plate and 1st-3rd somites (dorsal) of *Cormocephalus nitidus* Porath.
Fig. 19. Anal somite, pleurae and femur of anal legs showing armature (ventral).

Cormocephalus elegans Porath.

Habitat: Pretoria; Makoetsi River, near Leydsdorp (Tvl.), and several other localities in the Transvaal; Alicedale (C. Prov.); Redhouse (C. Prov.).

Cormocephalus setiger Porath.

Habitat: Wasserfall (Tvl.); Pretoria (B. Penfold and G. P. F. van Dam); Sunnyside, Pretoria, and several other localities principally in the Transvaal; Port Elizabeth; Cradock (G. P. F. van Dam); Capetown (A. Roberts); Kilgobbin, Dargle (Natal) (A. Roberts).

Cormocephalus anceps Porath.

Habitat: Venterskroon (Distr. Potchefstroom) (G. van Dam); Woodbush Village (P. Methuen); Doornkop, near Belfast (Tvl.) (R. Gerhardt); Port Elizabeth; Capetown; Kimberley and Natal; Roodepoort Dist., Pretoria (G. P. F. van Dam); Grahamstown (G. P. F. van Dam).

Cormocephalus calcaratus Porath.

Habitat: Sunnyside, Pretoria (P. Penfold).

Fig. 20.

Femur of anal leg of *Cormocephalus calcaratus* Porath, indicating the armature. (From *Revision der Scolopendriden*, Kraepelin.)



20

Cormocephalus dispar Porath.

Habitat: Sunnyside, Pretoria (B. Penfold); and several other localities in the Transvaal.

Key to the South African species of the Genus CORMOCEPHALUS.

1. First tergite generally without even a trace of a pair of median sulci. Marginations never begin beyond 17th somite. Process of pleura bifid, head-plate very often with basal-plates and a pair of abbreviated median sulci. Femur of anal legs armed on ventral outer surface normally with two rows of spines, which may number 2, 2 up to 4, 5. Claws of anal legs usually without spurs. Sternocoxal plate (prosternal plate) without fine undulating transverse sulci on anterior third 2
2. Femur of anal legs on ventral outer surface armed normally with 2, 2 spines. Last or anal tergite with single median sulcus 3
 Femur of anal legs armed on ventral outer surface normally with 2, 3 (seldom 1, 3) up to 5, 5 spines. Last or anal tergite without median sulcus 6
3. Marginations of tergites begin from third to sixth somite. Segments of antennae elongate, longer than broad 4
 Marginations of tergites begin from eighth to thirteenth somite. Segments of antennae generally scarcely longer than broad 5
4. All the legs (exc. 21st pair) carry spurs to claws; prosternal dentiferous plate separated by a narrow fissure **C. dispar** Porath
5. Anal tergite with median sulcus. Porous area of pleurae a narrow oval, hardly broader than the smooth outer margin of the pleura, neither does it extend to the posterior margin usually without a spine. Femur of the anal legs on dorsal inner surface usually with one spine besides the terminal bifid spine. Length only up to 45 mm. **C. setiger** Porath
6. From 5-8 segments of antennae naked, seldom 9 or 10, and in the latter case marginations begin from 6th-9th tergite 7
 11-16 segments of antennae naked (seldom only 9). Marginations of tergites begin from 12th-17th somite (seldom from 9th). Anal tergite with or without faint median sulcus (often only an indication on posterior half) **C. anceps** Porath

7. Anal tergite with median sulcus 8
 Anal tergite without median sulcus 10
8. Porous area of pleurae a narrow oval, not as broad as the naked outer surface, nor does it extend to the posterior margin or to the process of the pleura. Marginations of the tergites begin from the 12th or 13th somite. Claws of anal legs with spurs . . . **C. oligoporus** Kraepelin
 Porous area of the pleurae broader than the naked outer surface of same, and extending up to the posterior margin of the process. Marginations of the tergites usually begin only from 3rd-10th (seldom only from 15th) somite. Claws of anal legs without spurs 9
9. Femur of anal legs ventral outer surface armed with 2, 3 spines, inner surface only with 1-2 spines. Marginations of tergites begin from 7th-9th somite. Tergites without median depression. Pleurae cylindrical. Segments of antennae longer than broad. Up to 80 mm. **C. elegans** Kraepelin
10. Claws of anal legs with spurs. Femur of anal legs ventral outer surface generally with 3, 3-4, 5 spines (fig. 20). Only five segments of antennae are naked. Length up to 45 mm. **C. calcaratus** Porath
 Claws of anal legs without spurs. Femur of anal legs ventral outer surface with 2, 3 spines. 6-8 segments of antennae naked. Length up to 115 mm. **C. nitidus** Porath

Cormocephalus oligoporus (Swakopmund), *Cormocephalus brevicornis* (Mashonaland), *Cormocephalus pseudopunctatus* (Port Elizabeth) are the only remaining species not met with in the material placed at my disposal, and which have been recorded by Kraepelin in his *Revision der Scolopendriden*.

Genus SCOLOPENDRA Linnè, Newport.

Scolopendra morsitans Linnè. (Figs. 21, 22 and 23.)

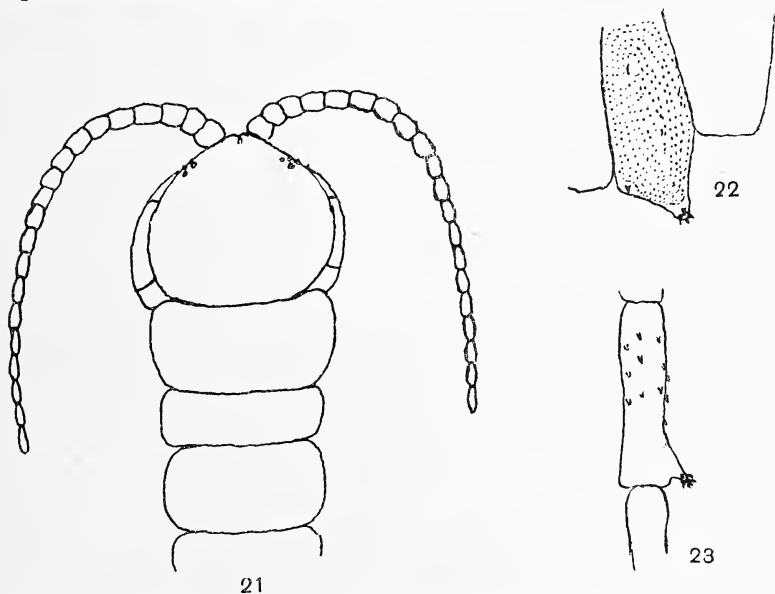


Fig. 21. Head and anterior region of *Scolopendra morsitans* Linnè.

Fig. 22. Pleurae showing the four spines at the process and the lateral spine of *Scolopendra morsitans* Linnè.

Fig. 23. Femur of anal leg showing armature and the five-pointed process in distal extremity of femur (*Scolopendra morsitans* Linnè).

Habitat: Pretoria; Geelhoutkop (Waterberg); Nijlstrom (Waterberg) (G. P. F. van Dam); Pretoria (G. P. F. van Dam); Piet Potgietersrust (G. P. F. van Dam and H. R. Pretorius); Lambert's Bay, Dist. Clanwilliam (A. Roberts).

Cosmopolitan in South Africa, *S. morsitans* can indeed boast over an extensive synonymy. With regard to the South African representatives of the genus Porath referred them to twelve different species. Several other species belonging to this cosmopolitan genus have shared the same fate in point of synonymy.

Scolopendra is the typical genus of the *Scolopendrinae*. With regard to its extensive synonymy Kraepelin correctly states:

“Nach dem etwa 250 Artnamen, welche für diese Gattung aufgestellt sind, sollte man schlieszen, dasz wir es in ihr mit der formenreichen Gruppe der ganzen Familie zu tun haben. In Wirklichkeit scheint dies jedoch keineswegs der Fall zu sein, da eine Gruppierung der Formen nach morphologisch definierbaren Charakteren kaum 2 Dutzend einigermäszen scharf von einander abgrenzbare Formenkreise erkennen lässt. Aber die Häufigkeit und ungemein weite Verbreitung dieser auffallenden, oft durch besondere Grösze ausgezeichneten Tiere, die Männigfaltigkeit ihrer Färbung, die Variabilität der meisten morphologischen Charaktere gegenüber einer im übrigen äusserst weitgehenden Gleichartigkeit des Gesamthabitus und eine oft geradezu niederdruckenden Geringfügigkeit der einigermäszen konstanten Charaktermerkmale, die von den älteren Autoren noch dazu meist völlig übersehen wurden, hat es mit sich gebracht, dasz jeder Autor die ihm vorliegenden Formen als neue beschreiben zu müssen geglaubt hat, und dasz so im Laufe der Jahre ein Chaos entstanden ist, das kaum entwirrbar erscheint....”

The following is a key to the widely distributed

SCOLOPENDRA MORSITANS.

First tergite without a rounded transverse groove on its anterior margin. First pair of legs generally with a tarsal spur.

Femur of all the legs without spinous tuberosity on the dorsal distal extremity. Head-plate without longitudinal sulci. Sternocoxal plate (prosternal plate) without transverse sulci. Pubescence of antennae not arranged in distinct longitudinal rows; 19–21 segments to antennae of which 6–8 are naked, seldom 17–18 segments of antennae present; prosternal dentiferous plate carries 4–5 distinct teeth; basal tooth of femur of maxillipedes generally carries a small tooth-like prominence at its base. First pair of legs armed ventrally with a tarsal spur. Marginations of the tergites generally commence only from the 20th somite. Sternites bisulcate up to 20th somite, sometimes the sulci do not extend across entire sternite. Anal tergite with a fine median sulcus.

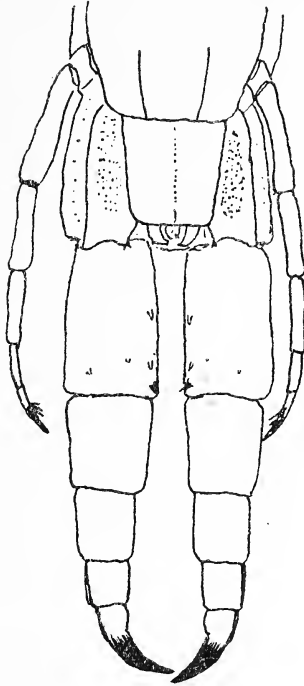
Pleurae with short truncated process carrying 1–5 spines, a posterior lateral spine often present.

Colour: “Färbung äusserst variabel, meist lehmgelb bis rotgelb, mit oder ohne grüne Hinterrande der Segmente, seltener olivbraun (wobei Kopf, sowie 1. und letztes Rückensegment meist heller gelbbraun), hellgrün mit dunkelgrünen Längstreifen (juv.) resp. Hinterrändern der Segmente, oder tief dunkelgrün. Länge in der Regel nur 70–90 mm.” (Kraepelin, *loc. cit.*).

The prevailing colour of the South African species is light yellow to creamy yellow, the tergites are marked with a dark-green edge laterally, anteriorly and posteriorly, often only laterally. Head-plate, first and second tergite, and anal tergite deep reddish brown tint. Entire dark green specimens are also fairly common with deep reddish brown head, first, second and anal tergites. The sternites have a lighter colour.

Genus *ARTHORHABDUS* Pocock.*Arthrorhabdus formosus* Pocock. (Fig. 24.)

Habitat: Port Elizabeth, Namaqualand, Willowmore, Steytlerville, Middelburg (C. Prov.); Victoria West; Steinkopf (S.W. Protectorate); Cradock (G. P. F. van Dam).



24

Fig. 24. Anal somite, pleurae and anal legs (ventral).
Arthrorhabdus formosus Pocock.

This species is very common in the dry Karroo districts of the Cape Colony. Its distribution beyond the Orange River into the Orange Free State and the Transvaal is very sparse. It is also found in Natal. Only two species are known:

- A. pygmaeus* Poc. in North America.
A. formosus Poc. in South Africa.

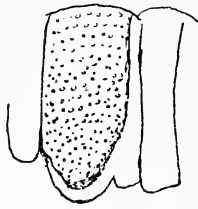
Genus *COLOBOPLEURUS* Kraepelin.*Colobopleurus devylderi* Porath. (Figs. 25, 27.)

Habitat: Namaqualand; Kimberley; Groenkloof; Rustenburg (Tvl.) (G. P. F. van Dam); Gezina, Pretoria (D. A. Stuart).

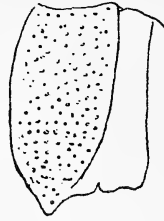
Colobopleurus parcespinatus Porath. (Figs. 26, 28.)

Habitat: Port Elizabeth. (In Albany Museum, Grahamstown.)

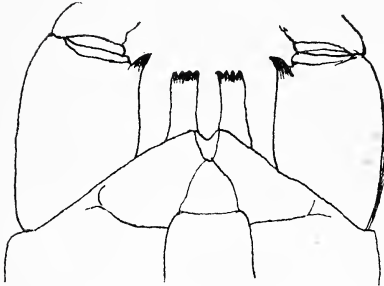
C. parcespinatus seems to be entirely confined to the southern coastal districts, *C. devylderi* predominating in the northern districts of South Africa. The genus is entirely confined to South Africa, as far as it is known.



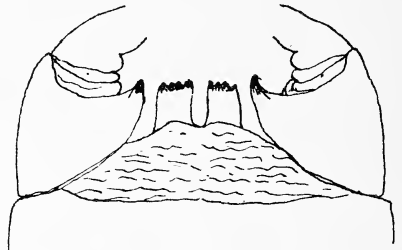
25



26



27



28

Fig. 25. Pleura of *Colobopleurus devylderi* Porath.

Fig. 26. Pleura of *Colobopleurus parcespinatus* Porath.

Fig. 27. Sternocoxal plate, prosternal plates and femur of maxillipedes of *Colobopleurus devylderi* Porath.

Fig. 28. Sternocoxal plate, prosternal plates and femur of maxillipedes of *Colobopleurus parcespinatus* Porath.

(Figs. 24, 25, 26, 27, 28 from *Revision der Scolopendriden*, Kraepelin.)

Key to the Species.

1. The prosternal teeth-plates at least twice as long as they are broad. Seventh to tenth segments of antennae are naked. Pleurae curved posteriorly, and do not end in a process. Femur of anal legs unarmed, at most a minute tuberosity at the distal extremity **C. devylderi** Porath
- The prosternal teeth-plates are scarcely longer than broad. Only first four segments of antennae are bare. Pleurae end in a blunt process interiorly. Femur of anal legs armed on the inside (sometimes on the ventral surface) with 1-3 small spines. **C. parcespinatus** Porath

Family LITHOBIIDAE Newport.

Several specimens of *Lithobiidae* were found in the collection, but *Scolopendridae* is by far the predominating family. Only four or five representatives of *Lithobiidae* from Grahamstown (G. P. F. van Dam) are recorded. They agree very well with the species *Henicops* (Newport) *africana* Porath, which

Porath founded and described from Caffraria (Transkei). (See Porath, *Myriopoda Africae Australis*.)

Family GEOPHILIDAE.

Likewise this family constitutes an extremely small fraction of South African Chilopoda. Porath describes a species belonging to the genus *Geophilus* (Meinert). The specimens from Grahamstown probably belong to the same genus. Porath referred his specimens to the genus *Geophilus*, but did not determine the species. His specimens were obtained from Caffraria (Transkei) and are recorded in *Myriopoda Africae Australis*.

NOTE ON A RELIC OF THE PHALLUS CULT AMONG THE M'KAHTLA

By PERCY A. WAGNER.

With 1 plate.

SCATTERED over the Elands River ward of the Pretoria district of the Transvaal are isolated communities of a native tribe known as the M'Kahtla or Vaal Kafirs. These on investigation prove to be Baralong, who at some date not definitely fixed migrated from the western Transvaal to their present habitat. In the well-known M'Kahtla village on the farm Rooifontein, No. 378, the writer recently came across an interesting relic of phallicism which it is the object of the present note to describe.

Travelling through the village the eye is at once arrested by two groups of tall poles, the one standing isolated from the huts and kraals in a field near the centre of the village, the other in an enclosure within a palisade.

The poles of the first group have evidently been standing for some considerable time as the wood of which they are composed is in an advanced state of decay. Of those within the palisade three look rather ancient. The fourth, shown in the accompanying photograph (Plate VI), which is covered with a decorative pattern in black, has evidently been erected quite recently.

Enquiries elicited the fact that the erection of the poles forms part of the circumcision rites of the tribe, the actual circumstances being as follows:

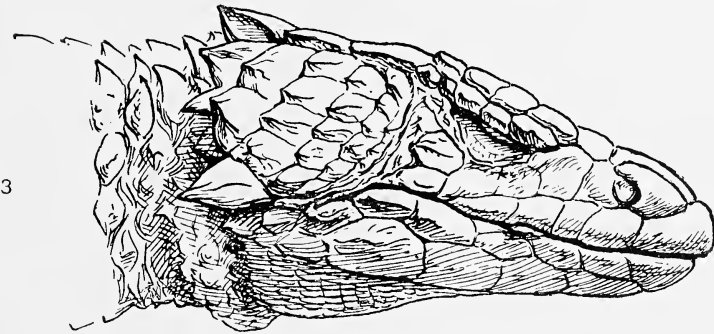
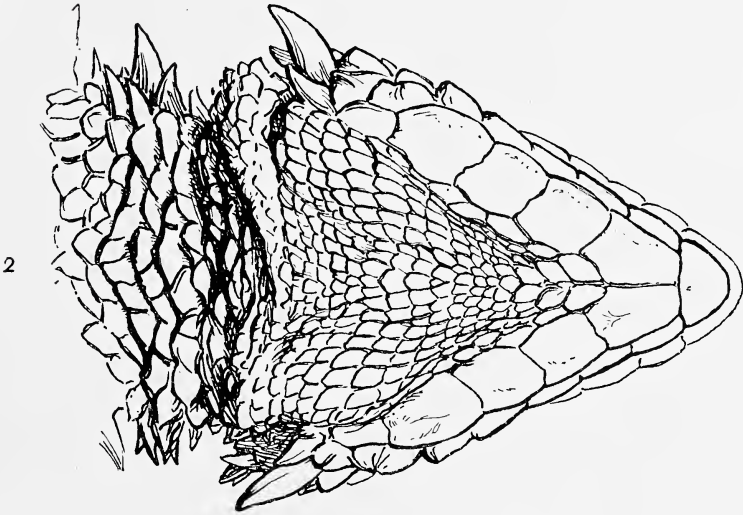
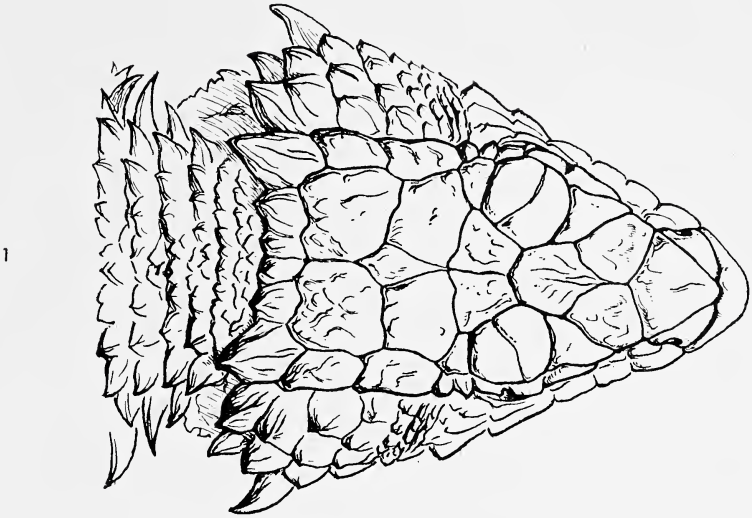
The so-called circumcision chief and the adult natives and initiated youths, who have attended the ceremony, on the night of their return from the circumcision lodge, slaughter a cow and, having eaten it, proceed to plant in the ground a previously cut pole, which they decorate in the manner shown with a black pigment prepared from powdered charcoal and the fat of the cow.

The next morning, immediately after sunrise, the whole of the adult male populace assemble and dance round the pole shouting, "O women come and see what the cow has brought forth in the night." This is a signal for the women and children to join in the ceremony, the men continuing to sing and chant songs—for the most part highly obscene—peculiar to the occasion.

All the boys who are circumcised at the time are said to belong to the same regiment, and each regiment has as its emblem its own pole, which is held in great veneration. In this respect the poles play much the same part in the initiation ceremony as the small conical stone erections or *Phiri*, which are put up alongside the circumcision lodges of the Bapedi of Sekukuniland¹.

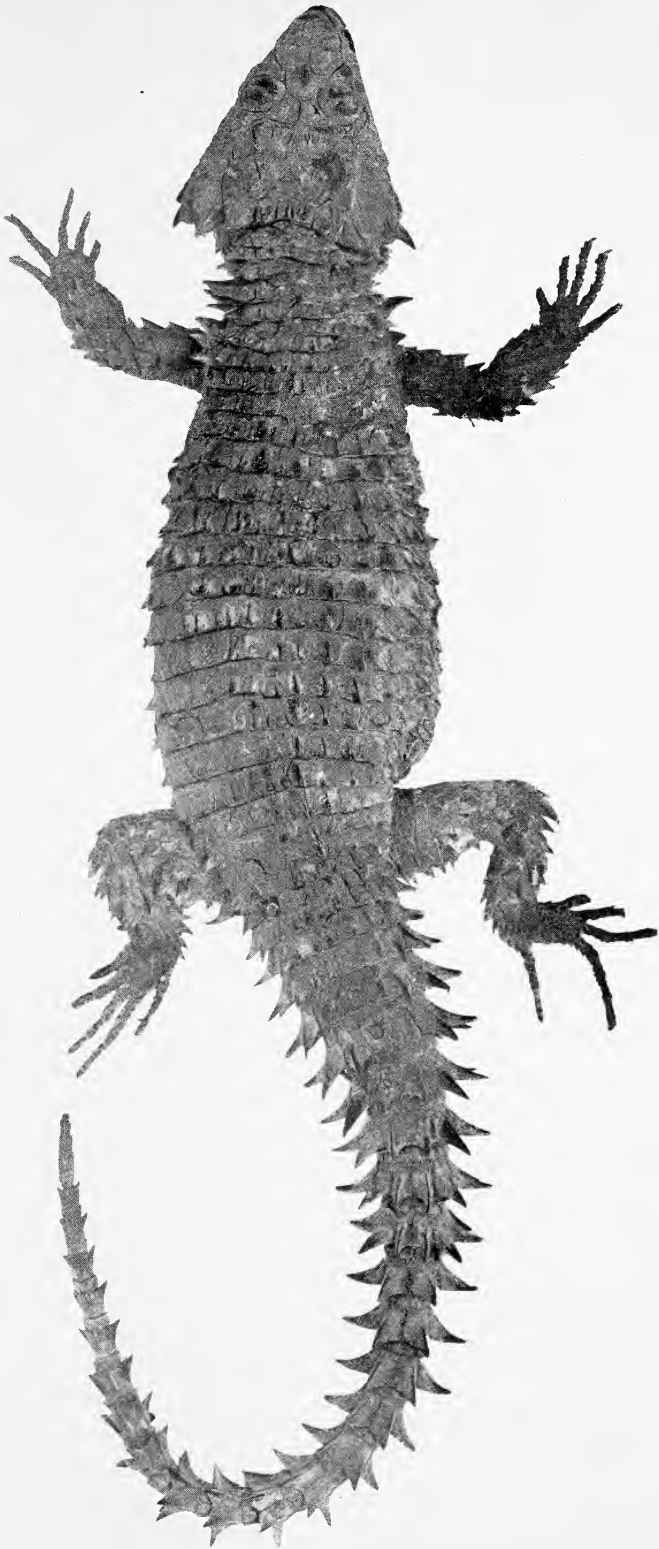
According to the testimony of educated natives the poles, which are called *Ramoleele* (literally "longer than anything else"), represent the male organ, and there can be no question, therefore, that we have to do with a survival of the Phallus cult; the whole ceremony being of the nature of what has been termed *sympathetic magic*. It is probably in some obscure pagan observance of this nature that the Maypole dance, which until a comparatively recent date figured so prominently in the May Day festivals of European peasants, had its origin.

¹ Cf. Roberts, N. and Winter, C. A. T., *S. A. Journ. Sci.* 1915, pp. 574-575. *



Zonurus breyeri sp. nov.





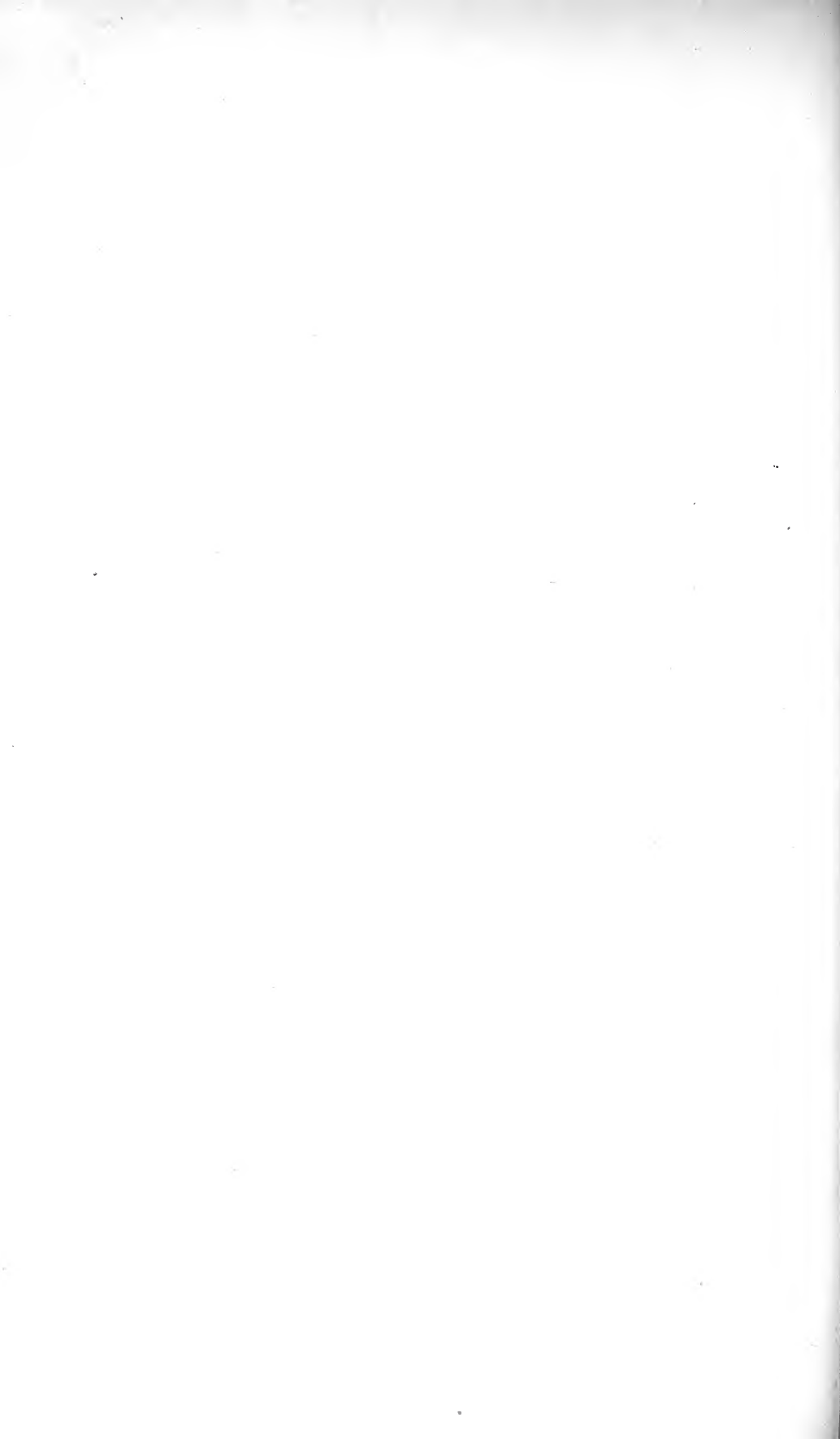
Zonurus breyeri sp. nov



Zonurus barbertonensis sp. nov.



Zonurus robertsi sp. nov.

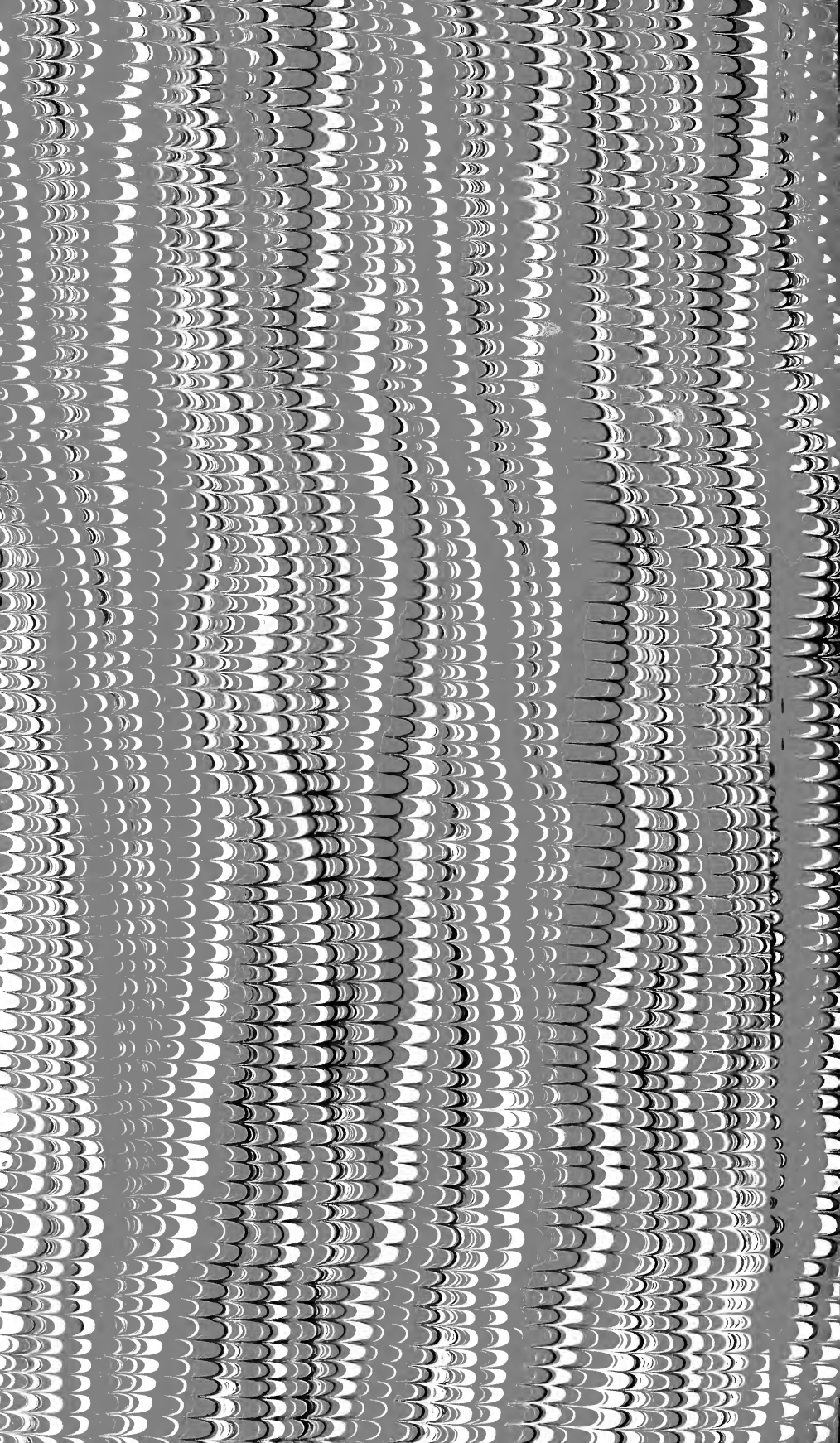


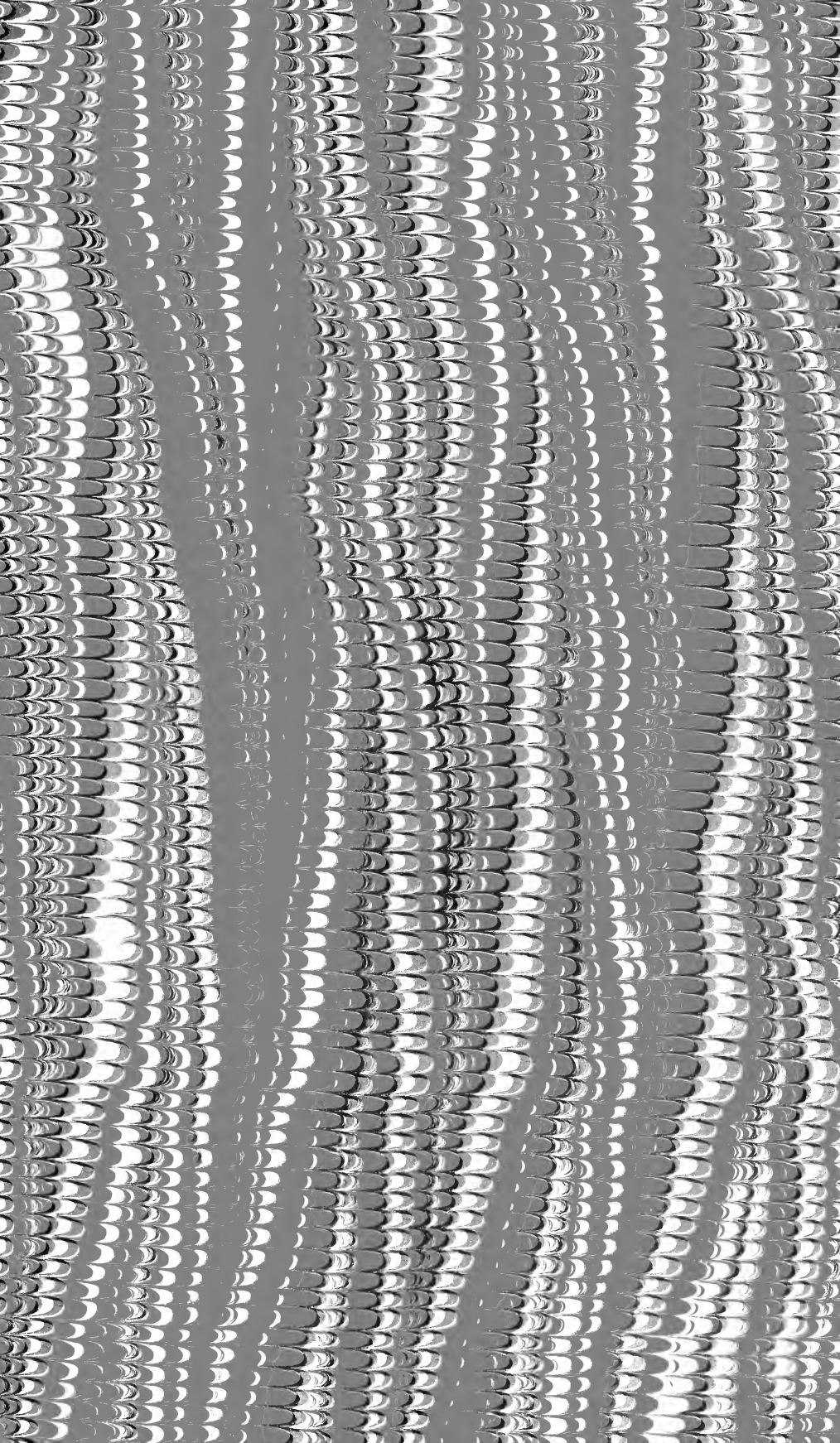


Pachydactylus capensis Smith var. nov. *tigrinus*









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