

VOL. V. Part 2.—pp. 97—196.

SEPTEMBER, 1914.

BULLETIN OF ENTOMOLOGICAL RESEARCH

ISSUED BY THE IMPERIAL
BUREAU OF ENTOMOLOGY.

EDITOR: THE DIRECTOR.

LONDON:

SOLD BY

DULAU & Co., Ltd., 37, SOHO SQUARE, W.

Price 4s. net.

All Rights Reserved.

IMPERIAL BUREAU OF ENTOMOLOGY.
HONORARY COMMITTEE OF MANAGEMENT.

THE EARL OF CROMER, G.C.B., G.C.M.G., O.M., Chairman.

LIEUT.-COLONEL A. ALCOCK, C.I.E., F.R.S.
MR. E. E. AUSTEN.
DR. A. G. BAGSHAWE.
SIR JOHN R. BRADFORD, K.C.M.G., F.R.S.
SURG.-GENERAL SIR DAVID BRUCE, C.B., F.R.S.
DR. S. F. HARMER, F.R.S.
PROF. H. MAXWELL LEFROY.
SIR JOHN McCALL.
DR. R. STEWART MACDOUGALL.
SIR JOHN McFADYEAN.
SIR PATRICK MANSON, G.C.M.G., F.R.S.
SIR DANIEL MORRIS, K.C.M.G.
PROF. R. NEWSTEAD, F.R.S.
PROF. G. H. F. NUTTALL, F.R.S.
PROF. E. B. POULTON, F.R.S.
LIEUT.-COLONEL SIR DAVID PRAIN, C.M.G., C.I.E., F.R.S.
MR. H. J. READ, C.B., C.M.G.
THE HON. N. C. ROTHSCHILD.
MR. HUGH SCOTT.
DR. A. E. SHIPLEY, F.R.S.
SIR STEWART STOCKMAN.
MR. F. V. THEOBALD.
MR. J. A. C. TILLEY.
MR. C. WARBURTON.

Director.

Mr. GUY A. K. MARSHALL.

Assistant Director.

Mr. S. A. NEAVE.

Secretary.

Mr. A. C. C. PARKINSON.

BULLETIN
OF
ENTOMOLOGICAL RESEARCH

**ISSUED BY THE IMPERIAL
BUREAU OF ENTOMOLOGY.**

EDITOR: THE DIRECTOR.

VOL. V.

LONDON:

**SOLD BY
DULAU & Co., LTD., 37, SOHO SQUARE, W.
1914-1915.**

IMPERIAL BUREAU OF ENTOMOLOGY

Honorary Committee of Management.

RT. HON. LEWIS HARCOURT, M.P., *Chairman.*

Lieutenant-Colonel A. W. ALCOCK, C.I.E., F.R.S., London School of Tropical Medicine.

Mr. E. E. AUSTEN, Entomological Department, British Museum (Natural History).

Dr. A. G. BAGSHAWE, Director, Tropical Diseases Bureau.

Sir J. ROSE BRADFORD, K.C.M.G., F.R.S., Secretary, Royal Society.

Surgeon-General Sir DAVID BRUCE, C.B., F.R.S., A.M.S.

Dr. S. F. HARMER, F.R.S., Keeper of Zoology, British Museum (Natural History).

Professor H. MAXWELL LEFROY, Imperial College of Science and Technology.

The Hon. Sir JOHN MCCALL, M.D., Agent-General for Tasmania.

Dr. R. STEWART MACDOUGALL, Lecturer on Agricultural Entomology, Edinburgh University.

Sir JOHN MCFADYEAN, Principal, Royal Veterinary College, Camden Town.

Sir PATRICK MANSON, G.C.M.G., F.R.S., Late Medical Adviser to the Colonial Office.

Sir DANIEL MORRIS, K.C.M.G., Late Adviser to the Colonial Office in Tropical Agriculture.

Professor R. NEWSTEAD, F.R.S., Dutton Memorial Professor of Medical Entomology, Liverpool University.

Professor G. H. F. NUTTALL, F.R.S., Quick Professor of Protozoology, Cambridge.

Professor E. B. POULTON, F.R.S., Hope Professor of Zoology, Oxford.

Lieutenant-Colonel Sir DAVID PRAIN, C.I.E., C.M.G., F.R.S., Director, Royal Botanic Gardens, Kew.

Mr. H. J. READ, C.B., C.M.G., Colonial Office.

The Honourable N. C. ROTHSCHILD.

Mr. HUGH SCOTT, Curator in Zoology, Museum of Zoology, Cambridge.

Dr. A. E. SHIPLEY, F.R.S., Master of Christ's College, Cambridge.

Sir STEWART STOCKMAN, Chief Veterinary Officer, Board of Agriculture.

Mr. F. V. THEOBALD, Vice-Principal, South Eastern Agricultural College, Wye.

Mr. J. A. C. TILLEY, Foreign Office.

Mr. C. WARBURTON, Zoologist to the Royal Agricultural Society of England.

The Chief Entomologist in each of the Self-governing Dominions is an *ex officio* member of the Committee.

General Secretary.

Mr. A. C. C. PARKINSON (Colonial Office).

Director and Editor.

Mr. GUY A. K. MARSHALL.

Assistant Director.

Mr. S. A. NEAVE.

Head Office.—British Museum (Natural History), Cromwell Road, London, S.W.

Publication Office.—27, Elvaston Place, London, S.W.

CONTENTS.

ORIGINAL ARTICLES.

	PAGE.
AUSTEN, ERNEST E. A dipterous parasite of <i>Glossina morsitans</i>	91
BACOT, A. W. The influence of temperature, submersion and burial on the survival of eggs and larvae of <i>Cimex lectularius</i>	111
BALLARD, E. Two pests of mahogany in Nyasaland.....	61
BEZZI, PROF. M. Two new species of fruit flies from Southern India.....	153
CUMMINGS, BRUCE F. Descriptions of five new species of Anoplura and Mallophaga.....	155
DISTANT, W. L. Notes on some injurious African Rhynchota.....	241
DURRANT, JOHN HARTLEY. A new cotton-seed moth (<i>Mometa zemiodes</i>) from West Africa.....	243
EDWARDS, F. W. New species of Culicidae in the British Museum, with notes on the genitalia of some African <i>Culex</i>	63
New Culicidae from Borneo and Hong Kong.....	125
New and little-known East African Culicidae.....	273
Diagnoses of new Bornean Culicidae.....	283
FROGGATT, WALTER W. Sheep-maggot flies in Australia.....	37
Australasian Hispidæ of the genera <i>Bronthispa</i> and <i>Promecothea</i> which destroy coconut palm fronds.....	149

(C156) Wt.P8/91. 1,000. 7.15. B. & F. Ltd. Gp.11/1.

	PAGE.
GOUGH, DR. L. H.	
Preliminary notes on Egyptian mosquitos.....	188
GREEN, E. ERNEST.	
Remarks on a small collection of Coccidæ from Northern Australia....	231
HAMPSON, SIR GEORGE F., Bart.	
Two new species of wood-boring moths from West Africa.....	245
HIRST, STANLEY.	
Preliminary list of the Acari occurring on the brown rat (<i>Mus norvegicus</i>) in Great Britain, with the description of a new species (<i>Haemogamasus</i> <i>oudemansi</i>).....	119
On the parasitic Acari found on the species of rodents frequenting human habitations in Egypt.....	215
JACK, RUPERT W.	
Tsetse-fly and big game in Southern Rhodesia.....	97
KING, HAROLD H.	
Further notes on the bionomics of <i>Tabanus ditaeniatus</i> , Macq., and <i>Tabanus</i> <i>taeniola</i> , P. de B.....	247
LAMBORN, DR. W. A.	
The agricultural pests of the Southern Provinces, Nigeria.....	197
LLOYD, LL.	
Further notes on the bionomics of <i>Glossina morsitans</i> in Northern Rhodesia	49
MARSHALL, GUY A. K.	
Four new injurious weevils from Africa.....	285
Some injurious Indian weevils (Curculionidae).....	377
NEAVE, S. A.	
The Tabanidae of Southern Nyasaland with notes on their life-histories	287
NEWSTEAD, PROF. R.	
Notes on <i>Phlebotomus</i> , with descriptions of new species.....	179
ROPER, RICHARD.	
An account of some Anopheline mosquitos found in British North Borneo, with description of a new species.....	187
ROTHSCHILD, THE HON. N. C.	
On some species of <i>Cacodmus</i> , a genus of bed-bugs.....	41
On three species of <i>Xenopsylla</i> occurring on rats in India.....	88

	PAGE.
RUTHERFORD, A.	
A note on <i>Pseudaonidia</i> , Newst.....	193
Some Ceylon Coccidae.....	259
SAVAGE, ROBT. E.	
The respiratory system of <i>Monophlebus stebbingi</i> , var. <i>octocaudata</i>	45
SHIBCORE, DR. J. O.	
Suggestions for the limitation and destruction of <i>Glossina morsitans</i>	87
SIMPSON, DR. JAS. J.	
Entomological research in British West Africa. V.—Gold Coast.....	1
STANTON, DR. A. T.	
The <i>Anopheles</i> of Malaya.—Part II.	129
A new Anopheline mosquito from Sumatra.....	373
STRICKLAND, C.	
The comparative morphology of the Anophelines <i>Nyssomyzomyia ludlowi</i> , Theo., and <i>N. rossi</i> , Giles.....	321
TURNER, R. E.	
A new species of <i>Mutilla</i> parasitic on <i>Glossina morsitans</i>	383
URICH, F. W.	
Descriptive of a new Froghopper from British Guiana.....	43
WATERSTON, JAMES.	
Notes on African Chalcidoidea.—I. & II.	249, 343
New species of Chalcidoidea from Ceylon.....	325

MISCELLANEOUS.

Collections received.....	94, 194, 269, 385
Observations on <i>Glossina morsitans</i> in Northern Rhodesia.....	381

PLATES.

	PAGE.
I.—IV.	Views of the Gold Coastfacing 36
V.—IX.	Tracheal system of <i>Monophlebus stebbingi</i> .., 47
X.—XIII.	Breeding places of <i>Glossina morsitans</i> ,, 60
XIV.—XVI.	<i>Haemogamasus ondemansi</i> , Hirst, and <i>H. nidi</i> , Mich., 124
XVII.	Injurious West African moths ,, 214
XVIII.—XXV.	Plants injured by pests in Southern Nigeria ,, 214
XXV.	Final ecdysis of <i>Zonocerus variegatus</i> ,, 214
XXVI.	Egg-masses of <i>Tabanus ditaeniatus</i> and pupa of <i>T.</i> <i>taeniola</i> ,, 248
XXVII. & XXVIII.	Early stages of East African Tabanidae ,, 320
XXIX.—XXXI.	Views of Southern Nyasaland ,, 320
XXXII. & XXXIII.	<i>Nyssomyzomyia ludlowi</i> , Theo., and <i>N. rossi</i> , Giles, ♂ & ♀....., 324

MAPS.

	PAGE.
Map of Gold Coast and Northern Territories to accompany report by Jas. J. Simpson (on <i>Glossina</i>)to face 36	
Plan of an area in which <i>Glossina morsitans</i> breeds ,, 60	
Sketch map of proclaimed Sleeping Sickness Area in Nyasaland..... ,, 90	
Map I. & II. showing distribution of <i>G. morsitans</i> in S. Rhodesia ,, 110	
Map III. & IV.—The western coast of British N. Borneo, showing distribution of <i>Anopheles</i> ,, 147	

ILLUSTRATIONS IN THE TEXT.

	PAGE.
<i>Cacodmus ignotus</i> , Roths., ♂, ♀.	42
„ <i>sparsilis</i> , Roths., sp. n., ♀	42
„ <i>villosus</i> , Roths., ♂, ♀.	42
<i>Tomaspis flavilatera</i> , Urich, sp. n., dorsal and lateral view of ♂; outer lateral view of left harpè	43
<i>Glossina morsitans</i> , effect of a blood clot in the sucking stomach	53
Hypopygium of:—	
<i>Culex trifilatus</i> , Edw., sp. n.	64
„ <i>andersoni</i> , Edw., sp. n.	66
„ <i>simpsoni</i> , Theo.	66
„ <i>neavei</i> , Theo.	67
„ <i>univittatus</i> , Theo.	67
„ <i>guiarti</i> , Blanch.	68
„ „ var. <i>grahami</i> , Theo.	69
„ <i>trifoliatus</i> , Edw., sp. n.	69
„ <i>individuosus</i> , Theo.	70
„ <i>laurenti</i> , Newst.	71
„ <i>perfuscus</i> , Edw., sp. n.	71
„ <i>perfidiosus</i> , Edw., sp. n.	72
Modified abdominal segments of the male, and receptaculum seminis of	
<i>Xenopsylla astia</i> , Roths., <i>X. brasiliensis</i> , Baker, and <i>X. cheopis</i> , Roths.	84
<i>Villa lloydi</i> , Aust., sp. n., ♂	92
<i>Laelaps echidninus</i> , Berl., dorsal and ventral view of protonymph, 119; ventral view of deutonymph, and chelicera	120
<i>Anopheles kochi</i> , Dön., larva, after first moult.	130
„ „ „ head and thorax of mature larva	131
„ <i>brevipalpis</i> , Roper; wing, front claws of ♂ and proboscis and palpi of ♀	141
<i>Haematopinus taurotragi</i> , Cummings, sp. n., abdominal segments of ♀; thoracic sternite of ♂ and ♀, 156; tracheal system	157
<i>Linognathoides spermophili</i> , Cummings, sp. n. ♂; mouth-parts, and abdominal pleurites dissected off	161
<i>Colpocephalum mjöbergi</i> , Cummings, sp. n. ♂ and ♀, upper and under side, mouth-parts, alimentary canal and genitalia	164, 165, 168
<i>Menopon robsoni</i> , Cummings, sp. n. ♀, mandibles, antenna, and maxillary palpus	171
<i>Goniocotes waterstoni</i> , Cummings, sp. n., head and prothorax of ♂, mouth-parts, and genitalia	175
<i>Phlebotomus ingrami</i> , Newst., sp. n., ♂ genital armature	180
„ <i>simillimus</i> , Newst., sp. n., proximal portion of antenna of ♂ and ♀, and wing of ♀	181
„ <i>minutus</i> , Rond., and var. <i>africanus</i> , Newst., lines giving relative length of 3rd segment of antennae of ♂♂ and ♀♀	181
„ <i>mascittii</i> , Grassi, genital armature of ♂	182

	PAGE.
<i>Phlebotomus mascittii</i> , ♂, proximal portion of antenna, and wing	183
„ „ ♂, ventral view of distal segment of superior clasper	184
„ <i>pernicius</i> , Newst., ♂, proximal portion of antenna, and wing, 183; distal segment of superior clasper (3 views)	184
„ <i>minutus</i> , Rond., ♂, genital armature	185
„ <i>roubaudi</i> , Newst., ♂, genital armature	186
„ <i>zeilanicus</i> , Ann., ♀, antenna and palpus	188
„ <i>longipalpus</i> , Lutz & Neiva, ♀, antenna; ♂, genital armature ..	189
„ <i>stantoni</i> , Newst., sp. n., tarsus, antennae, scales and palpus ..	190
„ <i>bedfordi</i> , Newst., sp. n., ♀, palpi and wing	192
<i>Pseudagrilus sophorae</i> , L.	199
<i>Araecerus fasciculatus</i> , de G.	206
<i>Paremydica insperata</i> , Fst.	207
<i>Balanogastriis kolae</i> , Desbr.	207
<i>Dermanyssus muris</i> , Hirst, ♀ & ♂, ventral and dorsal aspects, 215, 216; ventral view of deutonymph, 217; ventral and dorsal aspects of protonymph	218
„ <i>sanguineus</i> , Hirst, sp. n., ♀ & ♂, ventral and dorsal aspects, 219, 220; ventral view of deutonymph, 221; dorsal view of protonymph	222
„ <i>aegyptius</i> , Hirst, ♀, ventral and dorsal aspects, 223; ventral view of deutonymph, 224; dorsal view of protonymph	225
<i>Leiognathus bacoti</i> , Hirst, ♀, ventral and dorsal aspects, 226; dorsal view of ♂, 227; dorsal view of protonymph	228
<i>Aspidiotus fodiens</i> , Mask., pygidium of adult ♀	231
<i>Lecanium pseudexpansum</i> , Green, sp. n., adult female, and antennae, 233; stigmatic area	234
<i>Eremnus fulleri</i> , Mshl., sp. n., ♀	235
<i>Hyperoides fragariae</i> , Mshl., sp. n.	236
<i>Cyllophorus rubrosignatus</i> , Mshl., sp. n.	238
<i>Oxycareus amygdali</i> , Dist., sp. n.	241
<i>Arocatus continctus</i> , Dist.	242
<i>Pundaluoya simplicia</i> , Dist.	242
<i>Agaon fasciatum</i> , Waterston, sp. n., antenna and details	250, 251
<i>Sycoecus thaumastocnema</i> , Waterston, sp. n., details	254, 255
<i>Chalcis olethrius</i> , Waterston, sp. n., hind leg	257
Male claspers of :—	
<i>Ochlerotatus quasiunivittatus</i> , Theo., <i>O. dentatus</i> , Theo., <i>O. albocephalus</i> , Theo., <i>O. nigeriensis</i> , Theo., and <i>O. hirsutus</i> , Theo. ..	277
Male armature of <i>Ochlerotatus pembaensis</i>	278
Male claspers of :—	
<i>Taeniorhynchus chubbi</i> , Edw., sp. n.; <i>T. aurites</i> , Theo.; <i>T. chryso-soma</i> , Edw., sp. n.	280
<i>Silvius apiformis</i> , Neave, sp. n., and side-view of head	295
„ <i>monticola</i> , Neave, sp. n., 297; antenna of ♀	295
Terminal segments of larvae of <i>Chrysops</i> and <i>Haematopota</i>	297
Pupal asters of :—	
<i>Chrysops longicornis</i> , Macq., ♂ & ♀	298
„ <i>magnifica</i> var. <i>inornata</i> , Aust., ♂ & ♀	299
„ <i>wellmani</i> , Aust., ♂ & ♀	299
„ <i>bimaculosa</i> , Neave, sp. n., ♂ & ♀	301
<i>Haematopota insatiabilis</i> , Aust., ♀	305
„ <i>crudelis</i> , Aust.	306
„ <i>decora</i> , Walk., ♀, with dorso-lateral comb	306

Pupal asters of (cont.) :—

	PAGE.
<i>Tabanus maculatissimus</i> , Macq., ♀, with combs	308
„ <i>corax</i> , Lw., ♂ & ♀, with comb of ♀	308
„ <i>biguttatus</i> , Wied., ♂ & ♀, with combs	310
„ <i>ustus</i> , Walk., ♂, with combs of ♂ & ♀	311
„ <i>fraternus</i> , Macq., ♀, with comb	312
„ <i>atrimanus</i> , Lw., ♂ & ♀, with comb of ♀	313
„ <i>variabilis</i> , Lw., ♂ & ♀, with combs	314
„ <i>insignis</i> , Lw., ♂, with combs of ♂ & ♀	315
„ <i>laverani</i> , Surc., ♂, with comb	315
„ <i>nagamiensis</i> , Cart., ♂, with combs	316
„ <i>gratus</i> , Lw., ♂, with combs of ♂ & ♀	317
„ <i>obscuripes</i> , Ric., ♂	318
„ <i>medionotatus</i> , Aust., ♂	319
Imago of :—	
<i>Chrysops bimaculosa</i> , Neave, sp. n.	300
„ <i>woodi</i> , Neave, sp. n.	302
Side view of head of <i>Chrysops woodi</i> , and <i>C. austeni</i> , Neave, sp. n.	303
Wing of <i>Chrysops austeni</i>	304
<i>Tabanus corax</i> , Lw., syphon and anal segment of larva	309
<i>Nyssomyzomyia ludlowi</i> , Theo., egg, 321; clypeal hairs of full-grown larvae	322
„ <i>rossi</i> , Giles, egg, 321; clypeal hairs of full-grown larvae	322
<i>Trigonogastra rugosa</i> , Waterston, sp. n., antennae of ♂ & ♀, mandibles of ♂	327
„ <i>megacephala</i> , Waterston, sp. n., antennae of ♂ & ♀	328
<i>Closterocerus insignis</i> , Waterston, sp. n., ♀, details	331
„ <i>trifasciatus</i> , Westw., antenna of ♀	331
<i>Sympiesis purpureus</i> , Waterston, sp. n., ♀, details	334
<i>Syntomosphyrum taprobanes</i> , Waterston, sp. n., ♀, details	337
<i>Tetrastichodes asthenogmus</i> , Waterston, sp. n., ♀, antenna and mandible	340
Details of :—	
<i>Pleurotropis africana</i> , Waterston, sp. n.	348, 353, 357, 360
„ <i>amaurocoela</i> , Waterston, sp. n.	348, 355-357
„ <i>clinognathus</i> , Waterston, sp. n.	348, 351-353, 357
„ <i>homoea</i> , Waterston, sp. n.	348, 353, 357, 358
„ <i>illustris</i> , Waterston, sp. n.	357, 363
„ <i>mediopunctata</i> , Waterston, sp. n.	348, 353, 357, 359
„ <i>neavei</i> , Waterston, sp. n.	347, 348, 353, 357
„ <i>nigripes</i> , Waterston, sp. n.	348, 353-355, 357
„ <i>telenomi</i> , Crawf., antenna	352
<i>Syntomosphyrum glossinae</i> , Waterston, sp. n., imago and details	365, 366, 368
„ <i>phaeosoma</i> , Waterston, sp. n., antenna	366
<i>Tetrastichus melichlorus</i> , Waterston, sp. n., antenna and mandible	371
<i>Anopheles schüffneri</i> , Stanton, sp. n., palp and proboscis of ♀	373
„ „ „ „ hind leg	374
<i>Phytoscapus dissimilis</i> , Mshl., sp. n.	377
<i>Corigetus bidentulus</i> , Fst.	378
<i>Rhynchaenus mangiferae</i> , Mshl., sp. n.	378
<i>Pachytychius mungonis</i> , Mshl., sp. n.	380

ERRATA.

-
- P. 13, line 27, for "*O. quasigelidus*" read "*O. quasigelidus*."
- P. 15, line 37, for "*A. funesta*" read "*A. funestus*."
- P. 19, line 45, for "Makengo" read "Makongo."
- P. 27, line 4, for "*T. marmoratus*" read "*T. marmorosus*."
- P. 37, line 38, for "Agricturnl" read "Agricultural."
- P. 39, line 17, for "fowl" read "foal."
- P. 95, line 27, for "Lagos, S. Nigeria" read "N. Rhodesia."
- P. 106, line 8, for "restlessness" read "restlessness."
- P. 145, second footnote, for "Liecester's types" read "Leicester's types."
- P. 154, line 30, for "European" read "Ethiopian."
- P. 155, line 16, for "Knowsby" read "Knowsley."
- P. 190, line 22, for "Lutz" read "Lutz."
- P. 193, line 28, for "not conspicuous" read "quite conspicuous."
- P. 214, line 3, for "*boetica*" read "*baetica*."
- P. 269, line 18, for "Mr. J. A. Bovell" read "Mr. J. R. Bovell."
- P. 295, fig. 2, delete legend and read "Antenna of *Silvius apiformis*, sp. n. : (a) dorsal view ; (b) lateral view."
- P. 326, line 8, for "*T. megacephalus*" read "*T. megacephala*."
- P. 341, line 2, for "one-third" read "one-half."
- P. 352, line 28 } for "W. A. Patterson" read "W. H. Patterson."
- P. 372, line 45 }
- P. 362, line 8, for "**violaceus**" read "**violacea**."
-