

BULLETIN
OF
ENTOMOLOGICAL RESEARCH

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

EDITOR: THE DIRECTOR.

VOL. VI.

LONDON:

**SOLD BY
DULAU & Co., LTD., 37, SOHO SQUARE, W.
1915-1916.**

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, C.M.G., 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.

Mr. J. C. F. FRYER, Entomologist to the Board of Agriculture and Fisheries.

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.

Dr. GUY A. K. MARSHALL.

Assistant Director.

Mr. S. A. NEAVE.

Assistant Editor.

Mr. W. NORTH.

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

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

CONTENTS.

ORIGINAL ARTICLES.

	PAGE.
BAGNALL, RICHARD S.	
A new vine Thrips (Thysanoptera) from Cyprus.	199
BALLOU, H. A.	
Observations on insect pests in Grenada	173
BEZZI, PROF. M.	
On the Ethiopian fruit flies of the genus <i>Dacus</i>	85
CAMERON, ALFRED E.	
Potato spraying and dusting in New Jersey, U.S.A.	1
CLEARE, LAURENCE D.	
A butterfly injurious to coconut palms in British Guiana.	273
DOANE, R. W., and FERRIS, G. F.	
Notes on Samoan Coccidae, with descriptions of three new species.	399
DRAKE-BROCKMAN, Dr. R. E.	
Some notes on the bionomics of <i>Ornithodoros savignyi</i> in British Somaliland.	195
EDWARDS, F. W.	
On the British species of <i>Simulium</i>	23
Eight new mosquitos in the British Museum collection.	357
GREEN, E. ERNEST.	
On a new species of <i>Lecanium</i> from Northern Nigeria.	43
Notes on Coccidae collected by F. P. Jepson, Government Entomologist, Fiji	44
New species of Coccidae from Australia	45
Report on some Coccidae from Zanzibar, collected by Dr. W. M. Aders	375
On a new Coccid pest of cacao from Trinidad.	377
On a Coccid injurious to pine trees in the Himalayas	395

(C257) Wt. P. 8/91. 1,000. 5.16. B.&F.Ltd Gp.11/1.

A

	PAGE.
HIRST, STANLEY.	
On a widely distributed Gamasid mite (<i>Leiofnathus morsitans</i> , sp. n.), parasitic on the domestic fowl.....	55
On some new Acarine parasites of rats.....	183
HOWLETT, F. M.	
A preliminary note on the identification of sand-flies	293
Chemical reactions of fruit flies	297
KING, HAROLD H.	
Preliminary notes on the life-history of <i>Argas brumpti</i> , Neumann	191
KNAB, FREDERICK.	
Some new neotropical Simuliidae	279
LAMBORN, DR. W. A.	
A preliminary report on the problem of controlling <i>Glossina</i> in Nyasaland	59
Second report on <i>Glossina</i> investigations in Nyasaland.....	249
LUDLOW, C. S.	
The synonymy of <i>Anopheles christophersi</i> , Theo., and <i>A. indefinita</i> , Ludl.	155
MACFIE, DR. J. W. SCOTT.	
Observations on the bionomics of <i>Stegomyia fasciata</i>	205
MARSHALL, DR. GUY A. K.	
Some injurious Indian weevils (Curculionidae)—II.....	365
NUTTALL, PROF. GEORGE H. F.	
Ticks of the Belgian Congo and the diseases they convey	313
RICARDO, MISS GERTRUDE.	
Two new species of <i>Haematopota</i> from the Federated Malay States	403
Notes on a collection of species of Tabanidae from Hong Kong	405
SCHWETZ, DR.	
La limite occidentale de la <i>Glossina morsitans</i> dans le Katanga du Nord..	283
Quelques observations préliminaires sur les moeurs de la <i>Glossina</i> <i>brevipalpis</i>	289
SOLOMIDES, Z. G.	
Notes on a Thrips injurious to vines in Cyprus.....	197
STANTON, DR. A. T.	
The larvae of Malayan <i>Anopheles</i>	159
TAYLOR, FRANK H.	
A blood-sucking species of <i>Pericoma</i> in Queensland (Dipt.).....	267

	PAGE.
THEOBALD, FRED V.	
African Aphididae—Part II.	103
TOWNSEND, CHARLES H. T.	
Recent questioning of the transmission of verruga by <i>Phlebotomus</i>	409
WATERSTON, JAMES.	
Chalcidoidea bred from <i>Glossina morsitans</i> in Northern Rhodesia	69
Notes on African Chalcidoidea—III.	231
<i>Ooencyrtus pacificus</i> , a new egg parasite from Fiji (Hym.).....	307
Chalcidoidea bred from <i>Glossina morsitans</i> in Nyasaland	381
Notes on African Chalcidoidea—IV.	413
WILLIAMS, C. B.	
A new Thrips damaging coffee in British East Africa	269
<i>Thrips oryzae</i> , sp. nov., injurious to rice in India	353

MISCELLANEOUS.

Collections received	83, 203, 311, 425
Beetles boring in Aerial Cables	201
The <i>Stegomyia</i> Survey in Hong Kong.....	67

PLATES.

		PAGE.
I.—III.	Potato spraying and dusting in New Jersey	facing 22
IV.—VI.	Haunts and breeding-places of <i>Glossina morsitans</i> in Nyasaland	,, 266
	Wing of <i>Pericoma townsvillensis</i> , Taylor, sp. n.	,, 268
VIII.—X.	<i>Brassolis sophorae</i> in Georgetown, British Guiana, distri- bution and damage done	,, 278
	Eggs and larvae of <i>Phlebotomus</i>	,, 296
XI. & XII.	Fruit flies and their chemical reactions	,, 306
XVII.	Pine trees in the Himalayas, illustrating damage done by <i>Ripersia resinophila</i> , Green, sp. n.	,, 398

MAP.

		PAGE.
•	Carte du District du Lomami (Katanga, Congo Belge) et de la région orientale voisine, illustrant la répartition de la <i>Glossina brevipalpis</i> et la limite occidentale de la <i>G. morsitans</i>	to face 292

ILLUSTRATIONS IN THE TEXT.

	PAGE-
Watson sprayer	5
Potato Flea-beetle (<i>Epitrix cucumeris</i>)	15
British <i>Simulium</i> , ♂ genitalia, 24; ♀ claws, 26; ♀ front tarsi, 29; ♂ & ♀ hind tarsi or metatarsal joints, 31; wings, 35; tip of metatarsus and whole of second tarsal joint of three species	41
<i>Lecanium catori</i> , Green, sp. n., ♀, with details	43
<i>Eriococcus serratilibis</i> , Green, sp. n., ♀, with details	45
" " var. <i>prominens</i> , Green, nov., posterior extremity of ♀	46
<i>Rhizococcus lecanioides</i> , Green, sp. n., adult ♀, with details	47
" <i>lobulatus</i> , Green, sp. n., adult ♀, with details	46
Marginal pores of <i>Asterolecanium stypheliae</i> , Mask., and <i>A. styphelia</i> var. <i>multiporum</i> , Green, nov.	48
<i>Pulvinaria maskelli</i> , Olliff, var. <i>novemarticulata</i> , Green, nov., and <i>P. maskelli</i> var. <i>spiniosior</i> , Green, details and ♀	48
<i>Chionaspis frenchi</i> , Green, sp. n., pygidium of adult ♀	49
<i>Aspidiotus bidens</i> , Green, sp. n., pygidium of adult ♀	50
" <i>cedri</i> , Green, sp. n., adult ♀ & posterior margin	51
" <i>tasmaniae</i> , Green, sp. n., pygidium of adult ♀	50
<i>Mytilaspis beyeriae</i> , Green, sp. n., pygidium of adult ♀	52
<i>Protodiaspis anomala</i> , Green, sp. n., adult ♀ and pygidium, 52; nymphal pellicle and posterior extremity of same	53
<i>Leiognathus morsitans</i> , Hirst, dorsal view of ♀, 55; ventral view and chelicera of ♂, 56; dorsal view of protonymph	57
<i>Stomatoceras micans</i> , Waterston, sp. n., ♀ and details	70, 72
<i>Anastatus viridiceps</i> , Waterston, sp. n., ♀, ♂ and details	75, 76, 80
<i>Dacus</i> , chaetotaxy, 85, 86; wings	88
" <i>armatus</i> , F., wing	92
" <i>bivittatus</i> , Big., view of thorax to show hypopleural spots	92
" <i>brevis</i> , Coq., wing	99
" <i>disjunctus</i> , Bezzi, sp. n., view of thorax to show hypopleural spots, 97; wing	97
" <i>eburneus</i> , Bezzi, sp. n., view of thorax to show the single hypopleural spot, 93; wing	94
" <i>ficolora</i> , Bezzi, sp. n., wing	101
" <i>humeralis</i> , Bezzi, sp. n., wing	96
" <i>sphaeristicus</i> , Speiser, wing	91
" <i>xanthopterus</i> , Bezzi, sp. n., wing	95

Details of :—	PAGE.
<i>Macrosiphum compositae</i> , Theo., sp. n.	106
„ <i>hederae</i> , Theo., sp. n.	108
„ <i>nigrinectaria</i> , Theo., sp. n.	107
„ <i>rosaefolium</i> , Theo., sp. n.	109
„ <i>rosaeollae</i> , Theo., sp. n.	110
<i>Myzus rosarum</i> , Kalt. and Buckt.	110, 111
„ <i>asclepiadis</i> , Pass.	129, 130
„ „ var. <i>nigripes</i> , Theo.	129, 130
„ <i>nerii</i> , Schr.	129, 130
<i>Macrosiphoniella chrysanthemi</i> , Del G.	113
<i>Rhopalosiphum carduellinum</i> , Theo., sp. n.	113, 114
„ <i>lactucellum</i> , Theo., sp. n.	115, 116
<i>Siphocoryne splendens</i> , Theo., sp. n.	117
<i>Aphis compositae</i> , Theo., sp. n.	123
„ <i>cynarae</i> , Theo., sp. n.	124
„ <i>hederella</i> , Theo., sp. n.	119
„ <i>leguminosae</i> , Theo., sp. n.	121
„ <i>parvus</i> , Theo., sp. n.	127
„ <i>pseudocardui</i> , Theo., sp. n.	120
„ <i>punicella</i> , Theo., sp. n.	126
<i>Neotoxoptera violae</i> , Theo., sp. n.	131
<i>Chaitophorus populi</i> , L.	133
<i>Callipterus ononidis</i> , Kalt.	135, 136
<i>Saltusaphis scirpus</i> , Theo., sp. n.	139, 140
<i>Anoecia corni</i> , L.	143
„ <i>panicola</i> , Thos.	143
„ <i>willcocksi</i> , Theo., sp. n.	142, 143
<i>Protolachnus tuberculostemmata</i> , Theo., sp. n.	145, 146
<i>Pemphigus globulosus</i> , Theo., sp. n., 147; gall of	148
<i>Tychea phaseoli</i> , Pass.	150
<i>Rhizobius graminus</i> , Buckt.	152
Diagrams to show position of hairs on <i>Anopheles</i> larvae, dorsal surface of head, 159; thorax	161
Larva of <i>Anopheles sinensis</i> , newly hatched, after first moult, and after second moult	160
Details of larvae of :—	
<i>Anopheles aconitus</i> , Dön.	163
„ <i>aitkeni</i> , James	163, 164
„ <i>barbirostris</i> , Wulp	161, 166
„ <i>fuliginosus</i> , Giles	166, 167
„ <i>karicari</i> , James	167
„ <i>kochi</i> , Dön.	168
„ <i>leucosphyrus</i> , Dön.	169
„ <i>rossi</i> var. <i>indefinitus</i> , Ludl.	170
„ <i>sinensis</i> , Wied.	160, 161
„ <i>umbrosus</i> , Theo.	171
<i>Laelaps nuttalli</i> , Hirst, sp. n., ♀ ventral and dorsal aspects, 183; ♂ ventral aspect	184
<i>Microthrombidium gliricolens</i> , Hirst, sp. n., dorsal aspect, 185; ventral aspect of palp and body	186
<i>Schöngastia indica</i> , Hirst, sp. n., dorsal aspect, 187; ventral aspect of palp and body	188
<i>Schöngastiella bengalensis</i> , Hirst, sp. n., dorsal aspect, 189; ventral aspect of palp and body	190

Details of:—

	PAGE.
<i>Tetrastichus atriclavus</i> , Waterston, sp. n.	232, 234
„ <i>balteatus</i> , Waterston, sp. n.	239, 242
„ <i>mauripennis</i> , Waterston, sp. n.	232, 236
„ <i>sculpturatus</i> , Waterston, sp. n.	239, 240
„ <i>tachos</i> , Walk.	245
<i>Syntomosphyrum glossinae</i> , Wtrst.	245
„ <i>phaeosoma</i> , Wtrst.	245, 246
<i>Diarthrotrips coffeae</i> , Williams, sp. n.	270
<i>Ooencyrtus pacificus</i> , Waterston, sp. n.	309
„ <i>lamborni</i> , Waterston, sp. n.	421, 423
<i>Thrips oryzae</i> , Williams, sp. n.	354
<i>Philephedra theobromae</i> , Green, sp. n.	378
<i>Eupelminus tarsatus</i> , Waterston, sp. n., 389; ♀ imago	390
<i>Ripersia resinophila</i> , Green, sp. n.	395, 396
<i>Timioderus refringens</i> , Waterston, gen. et sp. n.	414, 415, 416
<i>Spilochalcis andersoni</i> , Waterston, sp. n.	418
<i>Brassolis sophorae</i> , L., larva, and lateral and dorsal view of pupa	275
Diagram to show duration of egg, larval and pupal stages of three species of <i>Phlebotomus</i> at different seasons	295
Formulae of eugenol and iso-eugenol	299
<i>Argas persicus</i> , male capitulum in ventral aspect	314
<i>Argas</i> and <i>Amblyomma</i> , dorsal aspects	315
<i>Ornithodoros moubata</i> , Murray, ♀ dorsal and ventral aspects	315
<i>Ixodes hexagonus</i> , Leach, replete ♀, dorsal and ventral aspects	316
„ <i>rasus</i> , Neum., ♂ and ♀, dorsal and ventral aspects with details	318
„ <i>ricinus</i> , L., ♂ ventral and dorsal aspects	316
Scheme showing degrees of affinity of Ixodidae	317
<i>Haemaphysalis leachi</i> , Aud., ♂ and ♀ dorsum and venter with details	319
„ <i>parvata</i> , Neum., ♂ and ♀ dorsal and ventral details	320
<i>Dermacentor circumguttatus</i> , Neum., ♀ and ♂ scutums	321
„ <i>rhinocerotis</i> , de G., ♂ dorsum, ♀ scutum, ♀ and ♂ digits	321
<i>Rhipiceator bicornis</i> , Nutt. and Warb., ♂ and ♀ dorsal aspects, ♂ ventral aspect	322
Dorsal and ventral aspects, with details, of:—	
<i>Rhipicephalus appendiculatus</i> , Neum.	324, 325, 326
„ <i>evertsi</i> , Neum.	327
„ <i>falcatus</i> , Neum.	327
„ <i>lunulatus</i> , Neum.	327
„ <i>sanguineus</i> , Latr.	328, 329, 330
„ <i>simus</i> , Koch	331
„ <i>supertritus</i> , Neum.	331
„ <i>tricuspis</i> , Dön.	332
<i>Margaropus winthemi</i> , Karsch, ♂ ventral aspect, ♀ capitulum and scutum	333
<i>Boophilus decoloratus</i> , Koch, ♂ dorsum and venter, ♀ capitulum and scutum	334
<i>Hyalomma aegyptium</i> , L., ♂ dorsum and venter, ♀ capitulum in dorsal and ventral aspects, 335; larva	336
<i>Amblyomma hebraeum</i> , Koch, ♂ scutum	337
„ <i>marmoreum</i> , Koch, ♂ scutum	338
„ <i>pomposum</i> , Dön., ♂ dorsum	338
„ <i>splendidum</i> , Giebel, ♂ and ♀ dorsum	337
„ <i>trimaculatum</i> , Neumann, ♀ capitulum and scutum	338
„ <i>variegatum</i> , F., ♂ dorsum	337

	PAGE.
<i>Aponomma exornatum</i> , Koch, ♀ capitulum, scutum and tarsus iv.	339
<i>Haemaphysalis cinnabarina</i> var. <i>punctata</i> , Can. and Fan., ♀: showing mechanism of chelicera	341
Male genitalia of:—	
<i>Culex ingrami</i> , Edw., sp. n.	360
,, <i>nilgircus</i> , Edw., sp. n.	359
,, <i>pacificus</i> , Edw., sp. n.	361
<i>Anopheles domicolus</i> , Edw., sp. n., wing	364
<i>Emperorrhinus defoliator</i> , Mshl. gen. et sp. n., head	366
<i>Ceuthorrhynchus portulacae</i> , Mshl., sp. n.	368
<i>Baris portulacae</i> , Mshl., sp. n.	370
<i>Athesapeuta oryzae</i> , Mshl., sp. n.	371
<i>Acythopeus citrulli</i> , Mshl., sp. n.	372
<i>Philephedra theobromae</i> , sp. n., on cacao pod; photographed in alcohol	377
<i>Hockeria munda</i> , Wtrst., sp. n., details	382, 383
<i>Haltichella edax</i> , Wtrst., sp. n., hind femur	383
<i>Stomatoceras micans</i> , Wtrst., hind femur	383
,, <i>exaratum</i> , Wtrst., sp. n., details	382, 385, 386
,, <i>octodentata</i> , Cam., details	383, 387
,, <i>diversicornis</i> , Kirby, propodeon	388
Puparia of <i>Glossina</i> , showing holes of emergence of <i>Syntomosphyrum</i> <i>glossinae</i> , Wtrst., and <i>Stomatoceras micans</i> , Wtrst.	393
<i>Ripersia resinophila</i> , Green, sp. n., adult ♀	395
Pygidium of:—	
<i>Chionaspis samoana</i> , Doane and Ferris, sp. n.	399
<i>Aspidiotus pangoensis</i> , Doane and Ferris, sp. n.	401
<i>Lepidosaphes moorsi</i> , Doane and Ferris, sp. n.	402
<i>Timioderus refringens</i> , Waterston, gen. et sp. n., ♀, details	414, 415, 416
<i>Spilochalcis andersoni</i> , Waterston, sp. n., details	418

ERRATA.

Page 27, line 20, for "6½"	read "5."
" " " 21, "5"	" "6½."
" 41, legend, after "Tip of"	insert "hind."
" 46, line 7, for "Townville"	read "Townsville."
" 58, " 24, "Columbia"	" "Colombia."
" 67, " 19, "indefinatus"	" "indefinitus."
" 67, " 26, "Ochelorotatus"	" "Ochlerotatus."
" 81, " 37, "Syntosmophyrum"	" "Syntomosphyrum."
" 99, last line, "brevis, Bezzi, Coq."	" "brevis, Coq."
" 104, line 37, "populus"	" "populi."
" 111, " 32, "dirhodum"	" "dirhodus."
" 220, " 26, "jut"	" "just."
" 221, " 32, "fasciata"	" "fasciata."
" 280, " 1, "COLUMBIA"	" "COLOMBIA."
" 282, " 15, "Cons iderin"	" "Considering."
" 365, " 25, "pyricola"	" "defoliator."
" 405, " 9, "sanguinarius"	" "sanguineus."