

Article VII.—TERMITES OF THE BELGIAN CONGO AND THE CAMEROON²

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Plates XX to XXXVIII, 24 Maps, and 79 Text Figures

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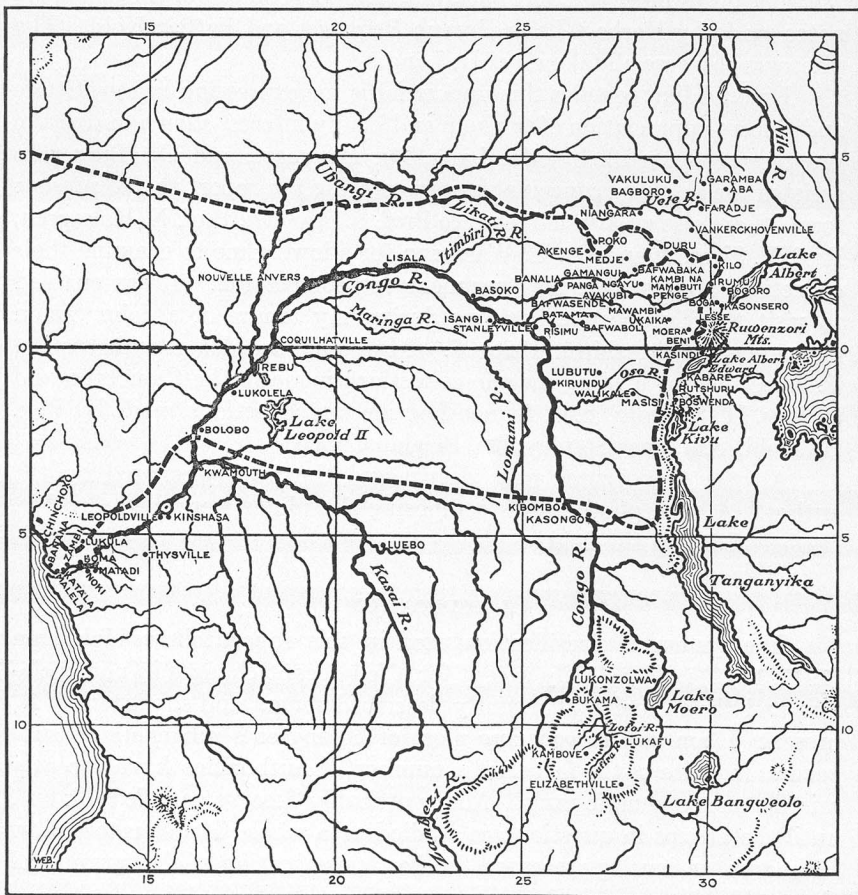
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INTRODUCTION

The following report is based on a study of a series of collections from the Belgian Congo and Cameroon. The largest collection was made



Map 1. The Congo Basin, showing the localities where collections were made by the American Museum Congo Expedition. The itinerary followed the Congo River up to Stanleyville, and more than five years were spent in the area from Stanleyville to Aba and Garamba.

by Mr. Herbert Lang and Mr. James P. Chapin during the American Museum Congo Expedition, 1909-1915, and to this has been added collections made by Dr. J. Bequaert and Rev. H. Kohl, S. J., in the Belgian Congo, and collections made by G. Zenker, W. C. Z. Evans and Anna

Lehman in the Cameroon. Altogether, many hundreds of colonies are represented of 78 different species classified in 27 genera and subgenera. Of these, 31 species, 1 subspecies and 2 varieties are considered new.

One of the most valuable parts of this report consists of the biological notes made by Herbert Lang, Joseph Bequaert and Father Kohl. The photographs were all taken by Mr. Lang.

I would like to take this opportunity for expressing my gratitude and sincere appreciation of the help and kindly interest shown during the progress of the work by Mr. Lang, Dr. Bequaert, and Dr. Lutz who assisted me in every conceivable way to bring the report to its present form. I am also greatly indebted to Prof. F. Silvestri, Prof. N. Holmgren, Prof. Y. Sjöstedt and Dr. E. Wasmann for allowing me to examine their collections and loaning me specimens for comparison. I was enabled to visit the European collections during my tenure of a John Simon Guggenheim fellowship in 1926-27. My thanks are also extended to Dr. F. M. Gaige for sending me the collections made in the Cameroon and to Rev. H. Schmitz, S.J., for sending me the collections made by Rev. H. Kohl, S.J., near Stanleyville, Belgian Congo.

All the text figures were drawn and the maps prepared by the author. All the photographs composing the plates were made by Mr. Herbert Lang in the field.

CLASSIFICATION

The system of classification used in this report follows Holmgren (1911, 1912) rather closely except for a few recent changes in nomenclature and the inclusion of recently described genera and subgenera. A present I am still considering most of Holmgren's subgenera as subgenera in spite of the fact that a number of authorities have recently raised some to generic rank. Many probably deserve generic rank but, until the groups in question are studied as a whole, I prefer to follow Holmgren as having presented the best classification of the termites of the world.

For purpose of distribution, however, I am treating the subgenera without grouping them under their respective genera. I am sure that the comparative data taken in this way are of more value than would otherwise be the case. Also, in all probability, a great many of these subgenera will soon be treated by most of the authorities as genera if they have not already been so classed.

Sjöstedt (1926) has recently published a thorough revision of African termites and their synonymies. This important book was published

after this manuscript was completed but I have revised the tables and general conclusions so as to conform with the new knowledge contained in Sjöstedt's work. I have not considered all the new groups described by Sjöstedt as constituting genera as I could not thus fit them into my catalogue of the world species without arbitrarily raising all subgenera to generic rank. Sjöstedt's classification, however, is entirely adequate for Ethiopian and Malagasy species and should be followed by workers in this restricted area.

GEOGRAPHICAL DISTRIBUTION OF TERMITES

Table I

General Distribution of the Genera and Subgenera of Termites¹

Genus or Subgenus	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Nearctic	Neotropical	Belgian Congo	Cameroon	Total Number of Species in Each Genus or Subgenus
<i>Mastotermes</i>	.	.	.	.	1	.	.	.	.	.	1
* <i>Hodotermes</i> , s. str.	6	.	.	.	.	.	.	.	.	.	6
* <i>Microhodotermes</i>	7	.	.	.	.	2	.	.	.	.	9
* <i>Anacanthotermes</i>	.	.	1	.	.	5	.	.	.	.	6
<i>Archotermopsis</i>	.	.	1	.	.	.	.	.	.	.	1
<i>Termopsis</i>	.	.	.	.	.	.	3	.	.	.	3
<i>Hodotermopsis</i>	.	.	2	.	.	.	.	.	.	.	2
<i>Stolotermes</i>	.	.	.	.	5	.	.	.	.	.	5
<i>Porotermes</i>	1	.	.	.	3	.	.	1	.	.	5
* <i>Kalotermes</i> , s. str.	3	.	4	1	5	3	11	15	.	.	42
* <i>Epicalotermes</i>	1	.	.	.	.	.	.	.	.	.	1
* <i>Proneotermes</i>	.	1	.	.	.	.	.	1	.	.	2
* <i>Neotermes</i>	12	8	10	13	9	1	1	15	2	3	70
* <i>Rugitermes</i>	.	.	.	.	.	.	.	9	.	.	9
* <i>Cryptotermes</i>	5	2	6	6	4	.	2	8	3	1	32
* <i>Planocryptotermes</i>	.	.	1	.	.	.	.	.	.	.	1
* <i>Procryptotermes</i>	.	2	.	2	.	.	.	2	.	.	6
* <i>Eucryptotermes</i>	.	.	.	.	.	.	.	1	.	.	1
* <i>Calcaritermes</i>	.	.	.	.	.	.	.	8	.	.	8
* <i>Glyptotermes</i>	2	2	9	2	10	.	.	12	1	.	38

*Subgenus. Genus not included as a whole.

¹The numbers refer to the number of species found in each region.

GEOGRAPHICAL DISTRIBUTION OF TERMITES (*Continued*)

Table I

General Distribution of the Genera and Subgenera of Termites

Genus or Subgenus	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Nearctic	Neotropical	Belgian Congo	Cameroon	Total Number of Species in Each Genus or Subgenus
<i>*Lobitermes</i>	.	.	1	.	.	.	.	3	.	.	4
<i>Psammotermes</i>	4	1	.	.	.	2	.	.	.	.	6
<i>Heterotermes</i>	1	.	4	.	9	.	1	6	.	.	21
<i>Reticulitermes</i>	.	.	2	.	.	5	10	.	.	.	14
<i>Stylotermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>Prorhinotermes</i>	.	1	5	4	.	.	.	3	.	.	13
<i>Coptotermes</i>	5	1	13	10	8	.	.	3	1	1	38
<i>Termitogeton</i>	.	.	2	.	.	.	.	.	.	.	2
<i>Termitogetonella</i>	.	.	1	.	.	.	.	.	.	.	1
<i>Parrhinotermes</i>	.	.	4	.	1	.	.	.	.	.	5
<i>*Macrorhinotermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>*Schedorhinotermes</i>	2	.	8	5	3	.	.	.	2	1	18
<i>*Rhinotermes, s. str.</i>	.	.	.	.	.	.	.	9	.	.	9
<i>Serritermes</i>	.	.	.	.	.	.	.	1	.	.	1
<i>*Acanthotermes</i>	1	.	.	.	.	.	.	.	1	1	1
<i>*Pseudacanthotermes</i>	6	.	.	.	.	.	.	.	4	1	6
<i>Synacanthotermes</i>	2	.	.	.	.	.	.	.	1	1	2
<i>*Alلودontermes</i>	5	.	.	.	.	.	.	.	2	.	5
<i>*Protermes, s. str.</i>	2	.	.	.	.	.	.	.	2	.	2
<i>Macrotermes</i>	20	.	12	.	.	.	.	.	10	5	32
<i>Sphaerotermes</i>	1	.	.	.	.	.	.	.	1	1	1
<i>*Termes, s. str.</i>	64	.	27	.	.	.	.	.	26	4	91
<i>*Cyclotermes</i>	10	.	18	.	.	.	.	.	3	2	28
<i>*Euscaiotermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>*Hypotermes</i>	.	.	4	.	.	.	.	.	.	.	4
<i>Ancistrotermes</i>	7	.	.	.	.	.	.	.	4	2	7
<i>Microtermes</i>	26	2	8	.	.	.	.	.	9	3	38
<i>Syntermes</i>	.	.	.	.	.	.	.	16	.	.	16
<i>*Labiatermes</i>	.	.	.	.	.	.	.	4	.	.	4
<i>*Cornitermes, s. str.</i>	.	.	.	.	.	.	.	10	.	.	10
<i>*Armitermes, s. str.</i>	.	.	.	.	.	.	.	17	.	.	17
<i>*Curvitermes</i>	.	.	.	.	.	.	.	2	.	.	2
<i>*Rhynchotermes</i>	.	.	.	.	.	.	.	3	.	.	3
<i>*Hirtitermes</i>	.	.	3	.	.	.	.	.	.	.	3

GEOGRAPHICAL DISTRIBUTION OF TERMITES (*Continued*)

Table I

General Distribution of the Genera and Subgenera of Termites

Genus or Subgenus	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Nearctic	Neotropical	Belgian Congo	Cameroon	Total Number of Species in Each Genus or Subgenus
<i>*Nasutitermes</i> , s. str.	27	9	53	9	22	.	.	73	21	6	192
<i>*Subulitermes</i>	1	.	5	3	.	.	.	11	.	.	20
<i>*Agnathotermes</i>	.	.	.	.	.	.	.	3	.	.	3
<i>*Tumulitermes</i>	.	.	1	.	4	.	.	.	.	.	5
<i>*Eutermellus</i>	2	.	.	.	.	.	.	.	1	.	2
<i>*Mimeotermes</i>	2	.	.	.	.	.	.	.	.	.	2
<i>*Occasitermes</i>	.	.	.	.	1	.	.	.	.	.	1
<i>*Convexitermes</i>	.	.	.	.	.	.	.	8	.	.	8
<i>*Rotunditermes</i>	.	.	1	.	.	.	.	1	.	.	2
<i>*Diversitermes</i>	.	.	.	.	.	.	.	3	.	.	3
<i>*Ceylonitermes</i>	.	.	2	.	.	.	.	.	.	.	2
<i>*Trinervitermes</i>	52	1?	4	.	1	.	.	.	14	1	58
<i>*Obtusitermes</i>	.	.	.	.	.	.	.	1	.	.	1
<i>*Uniformitermes</i>	.	.	.	.	.	.	.	1	.	.	1
<i>*Velocitermes</i>	.	.	.	.	.	.	.	5	.	.	5
<i>*Tenuirostritermes</i>	1	.	.	.	.	.	3	6	.	.	9
<i>*Constrictotermes</i>	.	.	.	.	.	.	.	3	.	.	3
<i>*Coarctotermes</i>	5	1	.	.	.	.	.	.	2	1	6
<i>*Longipeditermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>*Grallatotermes</i>	.	.	3	3	.	.	.	.	.	.	6
<i>*Lacessititermes</i>	.	.	10	.	.	.	.	.	.	.	10
<i>*Hospitalitermes</i>	.	.	12	.	.	.	.	.	.	.	12
<i>*Angularitermes</i>	.	.	.	.	.	.	.	1	.	.	1
<i>*Anoplotermes</i> , s. str.	10	.	.	.	.	.	1	30	1	2	40
<i>*Speculitermes</i>	.	.	1	.	.	.	.	2	.	.	3
<i>Protohamitermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>Prohamitermes</i>	.	.	2	.	.	.	.	.	.	.	2
<i>Eurytermes</i>	.	.	2	.	.	.	.	.	.	.	2
<i>Cephalotermes</i>	1	.	.	.	.	.	.	.	1	1	1
<i>Labritermes</i>	.	.	1	.	.	.	.	.	.	.	1
<i>Cylindrotermes</i>	.	.	.	.	.	.	.	2	.	.	2
<i>*Euhamitermes</i>	.	.	2	.	.	.	.	.	.	.	2
<i>*Drepanotermes</i>	.	.	.	.	5	.	.	.	.	.	5
<i>*Monodontermes</i>	.	.	.	.	3	.	.	.	.	.	3

GEOGRAPHICAL DISTRIBUTION OF TERMITES (*Continued*)

Table I

General Distribution of the Genera and Subgenera of Termites

Genus or Subgenus	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Neartic	Neotropical	Belgian Congo	Cameroon	Total Number of Species in Each Genus or Subgenus
* <i>Amphidotermes</i>	1	.	.	.	.	.	.	.	.	.	1
* <i>Amitermes</i> , s. str.	25	.	2	.	15	4	6	5	3	.	57
* <i>Synhamitermes</i>	.	.	2	.	.	.	.	1	.	.	3
* <i>Globitermes</i>	.	.	4	.	.	.	.	.	.	.	4
<i>Ahamitermes</i>	.	.	.	.	1	.	.	.	.	.	1
<i>Eremotermes</i>	.	.	2	.	.	1	.	.	.	.	3
<i>Thoracotermes</i>	2	.	.	.	.	.	.	.	1	1	2
<i>Crenitermes</i>	1	.	.	.	.	.	.	.	1	1	1
<i>Apilitermes</i>	1	.	.	.	.	.	.	.	.	1	1
<i>Hoplognathotermes</i>	3	.	.	.	.	.	.	.	.	1	3
<i>Apicotermes</i>	6	.	.	.	.	.	.	.	2	.	6
<i>Firmitermes</i>	1	.	.	.	.	.	.	.	.	.	1
<i>Trichotermes</i>	2	.	.	.	.	.	.	.	2	.	2
<i>Allognathotermes</i>	1	.	.	.	.	.	.	.	.	.	1
<i>Jugositermes</i>	1	.	.	.	.	.	.	.	.	1	1
* <i>Euchilotermes</i>	3	.	.	.	.	.	.	.	1	.	3
* <i>Ophiotermes</i>	4	.	.	.	.	.	.	.	3	1	4
* <i>Cubitermes</i>	61	.	.	.	.	.	.	.	22	9	61
* <i>Megagnathotermes</i>	1	.	.	.	.	.	.	.	.	.	1
* <i>Procubitermes</i>	25	.	.	.	.	.	.	.	6	4	25
* <i>Fastigitermes</i>	1	.	.	.	.	.	.	.	1	.	1
* <i>Probooscitermes</i>	1	.	.	.	.	.	.	.	1	1	1
* <i>Basidentitermes</i>	5	.	.	.	.	.	.	.	2	3	5
* <i>Orthotermes</i>	2	.	.	.	.	.	.	.	1	.	2
* <i>Ceratotermes</i>	3	.	.	.	.	.	.	.	2	.	3
* <i>Crepititermes</i>	.	.	.	.	.	.	.	1	.	.	1
* <i>Mirotermes</i> , s. str.	7	1	8	1	17	.	.	10	3	2	44
* <i>Cavitermes</i>	.	.	.	.	.	.	.	1	.	.	1
* <i>Protocapritermes</i>	.	.	.	.	1	.	.	.	.	.	1
* <i>Spinitermes</i>	.	.	.	.	.	.	.	5	.	.	5
* <i>Angulitermes</i>	4	.	.	.	.	.	.	.	.	.	4
* <i>Tuberculitermes</i>	1	.	.	.	.	.	.	.	1	1	1
* <i>Promirotermes</i>	8	.	.	.	.	.	.	.	2	.	8
<i>Microcapritermes</i>	.	.	1	.	.	.	.	.	.	.	1

TABLE II

Total Number of Genera and Subgenera, Number of Endemic Genera and Subgenera, and Percentage of Endemic Genera and Subgenera in each Region; also Number of Genera and Subgenera Common to other Regions, Percentage of Genera and Subgenera of each Region found in Common with other Regions, and the Number of Genera and Subgenera of each Region found only in Common with one other Region¹

Zoögeographical Regions	Total No. of Genera and Subgenera ¹	No. of Endemic Genera and Subgenera ¹	No. of Tropicopolitan General and Subgenera ¹	Genera and Subgenera ¹ in Common With								Genera and Subgenera ¹ Found Only in Common With							
				Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Nearctic	Neotropical	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Palaearctic	Nearctic	Neotropical
Ethiopian	62	38 or 61%	7 or 11%	..	10 or 16%	17 or 28%	10 or 16%	13 or 21%	6 or 10%	7 or 11%	15 or 24%	..	1	3	0	0	1	0	1
Malagasy	14	0	7 or 50%	10 or 71%	..	10 or 71%	10 or 71%	7 or 50%	3 or 21%	2 or 14%	10 or 71%	1	..	0	0	0	0	0	1
Indomalayan	52	23 or 44%	7 or 13%	17 or 33%	10 or 19%	..	13 or 25%	14 or 27%	7 or 13%	6 or 12%	16 or 31%	3	0	..	1	2	2	0	4
Papuan	14	0	7 or 50%	10 or 71%	10 or 71%	13 or 93%	..	9 or 64%	3 or 21%	3 or 21%	11 or 79%	0	0	1	..	0	0	0	0
Australian	22	7 or 32%	7 or 32%	13 or 59%	7 or 32%	14 or 64%	9 or 40%	..	4 or 18%	5 or 23%	11 or 50%	0	0	2	0	..	0	0	0
Palaearctic	9	0	2 or 22%	6 or 67%	3 or 33%	7 or 78%	3 or 33%	4 or 44%	..	4 or 44%	4 or 44%	1	0	2	0	0	..	0	0
Nearctic	9	1 or 11%	2 or 22%	7 or 78%	2 or 22%	6 or 67%	3 or 33%	5 or 56%	4 or 44%	..	7 or 78%	0	0	0	0	0	0	..	0
Neotropical	46	24 or 52%	7 or 15%	15 or 33%	10 or 21%	16 or 35%	11 or 24%	11 or 24%	4 or 9%	7 or 15%	..	1	1	4	0	0	0	0	..

¹Each subgenus is tabulated as a genus.

GEOGRAPHICAL DISTRIBUTION OF TERMITES (*Continued*)

Table I

General Distribution of the Genera and Subgenera of Termites

Genus or Subgenus	Ethiopian	Malagasy	Indomalayan	Papuan	Australian	Paleartic	Neartic	Neotropical	Belgian Congo	Cameroon	Total Number of Species in Each Genus or Subgenus
<i>Procapritermes</i>	.	.	3	.	.	.	.	.	.	.	3
<i>Homallotermes</i>	.	.	2	.	.	.	.	.	.	.	2
* <i>Neocapritermes</i>	1	.	.	.	.	.	.	11	.	.	12
* <i>Capritermes</i> , s. str.	.	1	34	1	.	.	.	.	.	.	36
* <i>Pericapritermes</i>	8	.	.	.	.	.	.	.	4	3	8
<i>Orthognathotermes</i>	.	.	.	.	.	.	.	4	.	.	4
<i>Microcerotermes</i>	38	3	12	8	16	3	.	4	13	5	84
<i>Foraminitermes</i>	1	.	.	.	.	.	.	.	.	1	1
<i>Pseudomicrotermes</i>	1	.	.	.	.	.	.	.	1	.	1
Unknown classification	7	4	2	.	3	1	.	5	2	1	22
Total for each region	520	40	322	71	147	27	38	346	186	73	

Table III

Total Number of Genera and Subgenera and Number of Endemic Genera and Subgenera found in each Region Divided according to Family¹

Zoögeographical Regions	Mastotermitidae	Hodotermitidae	Kalotermitidae	Rhinotermitidae	Termitidae
Ethiopian	0-0	2-1	6-1	4-0	50-36
Malagasy	0-0	0-0	5-0	3-0	6-0
Indomalayan	0-0	1-0	8-3	10-4	33-16
Papuan	0-0	0-0	5-0	3-0	6-0
Australian	1-1	0-0	6-1	4-0	11-5
Palaearctic	0-0	2-0	2-0	2-0	3-0
Nearctic	0-0	0-0	4-1	2-0	3-0
Neotropical	0-0	0-0	11-3	5-2	30-19

¹Each subgenus is tabulated as a genus.

Table IV
Number of Species Known from Each Region

		No. of Species
I. Neotropical	{ South America, except Patagonia; Central America; Mexico, except central and northern part; West Indies; tip of Florida.	346
II. Ethiopian	Africa south of the Sahara.	520
III. Malagasy	{ Madagascar, Comoros, Mauritius, Seychelles.	40
IV. Indomalayan	{ India, Indo-China, Ceylon, Indonesia including the Celebes, Philippines, Formosa, southern China.	322
V. Papuan	{ Moluccas, New Guinea, Oceania including Hawaii.	71
VI. Australian	Australia, Tasmania, New Zealand.	147
VII. Palearctic	{ Palearctic proper, Japan, northern China, North Africa, Europe, Asia Minor.	27
VIII. Nearctic	{ North America excluding the tip of Florida and southern and coastal Mexico.	38
Total number of species known from the world (counting thirteen over-lapping species but once and including five species of unknown habitat)		1503

Condensed Facts Drawn from the Tables

1.—The total number of Ethiopian genera and subgenera (62, or 47 per cent of the 131 known genera and subgenera) is the greatest number known from any region.

2.—Next to the Ethiopian Region, the Indomalayan with 52 and the Neotropical with 46 have the greatest number of genera and subgenera.

3.—The Ethiopian region has the largest number of species (520) of which 186 are found in the Belgian Congo and 73 are found in the Cameroon.

4.—The Ethiopian region has a greater number of endemic genera and subgenera (38) than any other region and also the percentage (61) of the Ethiopian genera and subgenera that is endemic is greater than that found in any other region.

5.—The Ethiopian fauna has more genera and subgenera (17) in common with the Indomalayan than with any other region and it also has more genera and subgenera (3) found only in common with the Indomalayan than with any other region.

6.—The Ethiopian fauna has fewer (4) genera and subgenera, of *Rhinotermitidæ* than the Indomalayan (10) and the Neotropical (5), and it is equal to the Australian (4). The Malagasy and the Papuan have three. Of the Ethiopian genera and subgenera of *Rhinotermitidæ*, none are endemic.

7.—The Ethiopian fauna has more (50) genera and subgenera of *Termitidæ* than any other region and of these a greater number (36) are endemic.

8.—The Ethiopian fauna comprises 7 tropicopolitan genera and subgenera (*Neotermes*, *Cryptotermes*, *Glyptotermes*, *Coptotermes*, *Nasutitermes*, *s.str.*, *Mirotermes*, *s.str.*, and *Microcerotermes*). In addition the subgenera *Kalotermes*, *s.str.*, and *Amitermes*, *s.str.*, are found in all but the Malagasy or Papuan regions; *Capritermes*, *s.lat.*, is tropicopolitan and the genus *Rhinotermites*, *s.lat.*, is found in all the tropical regions except Malagasy.

9.—The Ethiopian fauna comprises 38 endemic genera and subgenera (*Hodotermes*, *s.str.*, *Epicalotermes*, *Acanthotermes*, *Pseudacanthotermes*, *Synacanthotermes*, *Allodotermes*, *Protermes*, *s.str.*, *Sphærotermes*, *Ancistrotermes*, *Eutermellus*, *Mimeutermes*, *Cephalotermes*, *Amphidotermes*, *Thoracotermes*, *Crenetermes*, *Apilitermes*, *Hoplognathotermes*, *Apicotermes*, *Firmitermes*, *Trichotermes*, *Allognathotermes*, *Jugositermes*, *Euchilotermes*, *Ophiotermes*, *Cubitermes*, *Megagnathotermes*, *Procubitermes*, *Fastigitermes*, *Proboscitermes*, *Basidentitermes*, *Orthotermes*, *Ceratotermes*, *Angulitermes*, *Tuberculitermes*, *Promirotermes*, *Pericapritermes*, *Foraminitermes*, and *Pseudomicrotermes*). Of these, 16 are monotypic and the only ones listed with 4 or more species are *Hodotermes*, *s.str.* (6), *Pseudacanthotermes* (6), *Allodotermes* (5), *Ancistrotermes* (7), *Apicotermes* (6), *Ophiotermes* (4), *Cubitermes* (61), *Procubitermes* (25), *Basidentitermes* (5), *Angulitermes* (4), *Promirotermes* (8) and *Pericapritermes* (8).

Conclusions on the Distribution of Termites Which May Be Drawn from the Tables

1.—The Ethiopian fauna is more closely related to the Indomalayan than to any other fauna, 28 per cent of the Ethiopian genera and subgenera being found in the Indomalayan region and a greater proportion (3) being found only in common to these regions.

2.—Next to the Indomalayan fauna, the Ethiopian fauna shows closest affinities with the Neotropical.

3.—The Malagasy fauna shows close affinity with the Ethiopian fauna, 71 per cent of its genera and subgenera being also found in the Ethiopian region and one subgenus, *Coarctotermes*, is found only in these regions. The affinities with the Indomalayan, Papuan and Neotropical regions are as great with 71 per cent of the Malagasy genera and subgenera in common.

4.—The Indomalayan fauna shows greatest affinity with the Ethiopian, 33 per cent of its genera and subgenera being common to both regions. The next closest affinities are found with the Neotropical and Australian faunas, 31 per cent of the Indomalayan genera and subgenera being found in common with the Neotropical region and 27 per cent with the Australian.

5.—The Papuan region has been too little explored to allow generalizations. Nearly all of its known genera and subgenera, however, are also found in the Indomalayan region.

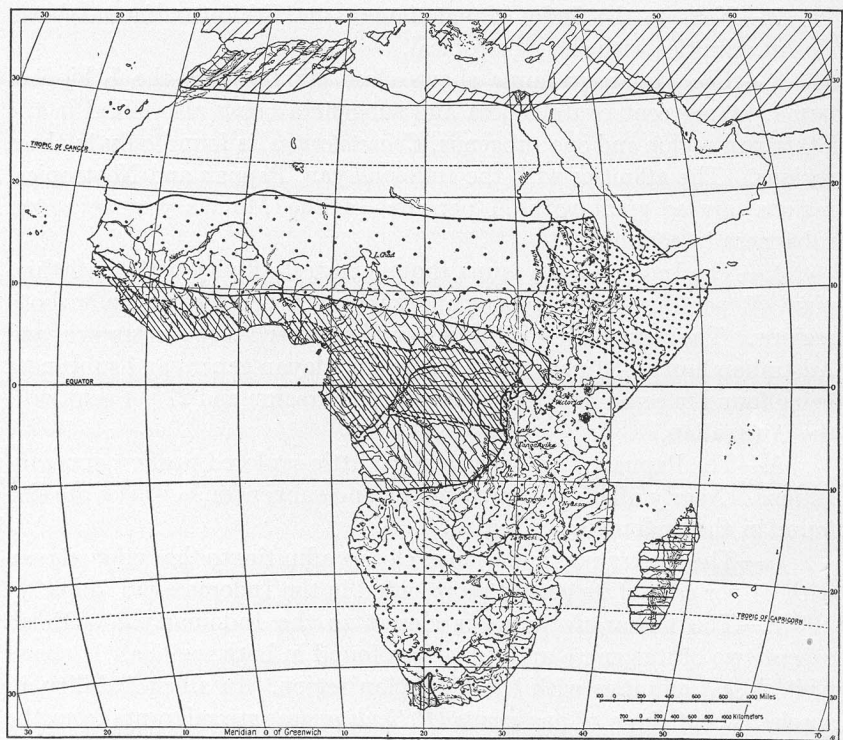
6.—The Australian fauna shows closest affinities to the Indomalayan with 64 per cent of its genera represented in the Indomalayan fauna.

7.—The Palearctic fauna is closest to the Indomalayan with all except two of its genera and subgenera found in both regions. It shows next closest affinities with the Ethiopian region. In all probability all species except those of one genus (*Reticulitermes*) are migrants from the southern regions.


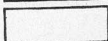
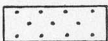
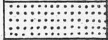



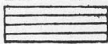

8.—The Nearctic fauna is most closely related to the Neotropical, although 78 per cent of its genera are also found in the Ethiopian region. However, one genus (*Reticulitermes*) is found only in common with the Palearctic region (for practical purposes excluding the Formosan records). With this exception, the data show that the migrations have been from the tropics north, as would be expected in the case of a tropical group like the Isoptera.

9.—The Neotropical fauna shows its closest affinities with the Indomalayan, 35 per cent of its genera and subgenera being found in both regions and 4 being found only in common to these two regions. It is next closest to the Ethiopian region with 33 per cent of its genera and subgenera found in both regions and one found only in common to these two regions.

10.—No region seems to be set widely apart from the rest, although the Ethiopian region seems to tend in this direction more than any other with 64 per cent of its genera and subgenera endemic and 520 described



Map 2. BOTANICAL REGIONS OF AFRICA
(After Engler)

- I. MEDITERRANEAN REGION..... 
- II. NORTH AFRICAN-ARABIAN DESERT REGION..... 
- III. ETHIOPIAN REGION
 - A. SAVANNAH PROVINCE
 - 1. Sudanese Subprovince..... 
 - 2. Northeastern Subprovince..... 
 - 3. Eastern and Southern Subprovince..... 
 - B. WESTERN FOREST PROVINCE..... 
Extent of Rain Forest indicated thus..... 
- IV. SOUTHWESTERN CAPE REGION..... 
- V. MALAGASY REGION..... 

species. Many of these genera and subgenera are monotypic, however. The Neotropical with 52 per cent of its genera and subgenera endemic and 346 described species is next most distinct followed closely by the Indomalayan with 44 per cent endemic genera and subgenera and 322 described species. The other regions follow in order: Australia (32 per cent endemic genera and subgenera and 147 described species), Nearctic (11 per cent endemic genera and subgenera and 38 described species), Malagasy, Palearctic and Papuan with no endemic genera or subgenera and 40, 27 and 71 described species respectively.

11.—The distribution of species in general seems to depend almost entirely upon the temperature, moisture, vegetation and water barriers. The scarcity of records, however, prevents many generalizations on the factors of the distribution of individual species, as the ranges are very indefinitely known in the vast majority of cases.

NEW NAMES PROPOSED FOR SPECIES ALREADY DESCRIBED

During the work on the Ethiopian termites I found that certain names were preoccupied and certain others needed to be changed for other reasons. Following is a discussion of each case.

An examination of the type of *Porotermes planiceps* (Sjöst.) reveals no subgeneric distinction and I am treating the subgenus *Planitermes* as a synonym of the genus *Porotermes*. Also the type of *Calotermes amabilis* Sjöstedt is a *Porotermes* and probably the imago of *P. planiceps*.

The specific name of *Calotermes paradoxus* Sjöstedt published on September 13, 1911 (Sjöstedt 1911d) was preoccupied by *Calotermes* (*Procryptotermes*) *paradoxus* Holmgren (1911b) published in June, 1911. I have examined the unique type of Sjöstedt's species and am sure that it is the imago of a species of *Cryptotermes*. As the soldier may possibly be already described, I hesitate to give a new name to the imago.

Fuller (1922) described *Termes* (*Termes*) *vulgaris*, subsp. *minor* although technically it is preoccupied by *Termes* (*Eutermes*) *odontognathus*, subsp. *minor* (Silvestri), a name used by Desneux (1904) for the species now known as *Armitermes* (*Curvitermes*) *minor* Silvestri. This is the most extreme case I have encountered where a rigid application of the rules of nomenclature would necessitate a change of names. I have corresponded with Fuller on the matter and he feels that the change should not be made. I am therefore letting the matter drop for the present and shall refer to the subspecies under Fuller's name.

Sjöstedt (1924a) described *Odontotermes congoensis* which later (1926) he changed to *Termes congoensis*. This name is preoccupied by

Termes congoensis Sjöstedt (1911) now placed in the genus *Microtermes*. I therefore propose the name *Termes (Termes) sjöstedti* to take the place of *Termes congoensis* Sjöstedt (1926).

Sjöstedt (1924b) described *Eutermes insularis* from Mauritius, a name preoccupied by *Eutermes insularis* Holmgren (1910) from Costa Rica. Snyder (1926d) has proposed the name *Nasutitermes (Nasutitermes) benjamini* for the species *Eutermes insularis* Sjöstedt (1924b).

Wasmann (1910) described *Eutermes mauritanus*, subsp. *minor*, a name preoccupied by *Eutermes minor* Holmgren (1906). Wasmann later changed the specific name and I am referring the species to *Nasutitermes*. I therefore propose the name *Nasutitermes (Nasutitermes) voeltzkowi* (Wasmann), subsp. *wasmanni* for this subspecies.

Sjöstedt (1924) described *Eutermes (Eutermes) nanus*. This name is preoccupied by *Eutermes nanus* Sjöstedt (1911) which is now referred to the genus *Anoplotermes*. I therefore propose the name *Nasutitermes (Nasutitermes) bequaerti* to replace *Eutermes (Eutermes) nanus* Sjöstedt (1924). The type locality is Barumbu, Belgian Congo. Sjöstedt erroneously stated the specimens were from Bumba.

Fuller (1922) named *Trinervitermes havilandi* (= *Termes trinervius* Haviland). I am including *Trinervitermes* as a subgenus under *Nasutitermes* in my catalogue and thus the name conflicts with *Nasutitermes (Nasutitermes) havilandi* (Desneux), a species described from Borneo. Sjöstedt (1924a) has renamed *Termes trinervius* Haviland as *Eutermes (Trinervitermes) messor*. As I believe that *Trinervitermes* will soon be recognized generally as a genus, Fuller's name will ultimately be the correct one in all probability. As long as I am including *Trinervitermes* as a subgenus of *Nasutitermes*, however, I shall use Sjöstedt's name.

Mirotermes (Cubitermes) schereri was described by von Rosen (1912). Silvestri (1914) discovered that the imago and soldier represented different species and proposed the name *Cubitermes proximatus* for the soldier and the name *Pericapritermes schereri* for the imago. Von Rosen, however, specifically designates the soldier as the type in his original description and of course the specific name should apply to the soldier in such a case. Sjöstedt (1926) finds that the species described by Silvestri (1914) is not *schereri*, however, and includes both *schereri* and *proximatus* as species of *Cubitermes*. In any case the imago described by von Rosen (1912) needs a new name and I therefore propose *Capritermes (Pericapritermes) silvestrianus*, to replace *Pericapritermes schereri* (von Rosen) as proposed by Silvestri (1914).

List of Proposed Changes in the Names of Ethiopian and
Malagasy Termites

- Termes* (*Termes*) *sjöstedti*, new name for *Termes congoensis* Sjöstedt (1926).
Nasutitermes (*Nasutitermes*) *voeltzkowi* (Wasmann), subsp. *wasmanni*,
 new name for *Eutermes voeltzkowi* Wasmann subsp. *minor* Wasmann.
Nasutitermes (*Nasutitermes*) *bequaerti*, new name for *Eutermes*
 (*Eutermes*) *nanus* Sjöstedt (1924).
Capritermes (*Pericapritermes*) *silvestrianus*, new name for *Pericapritermes*
schereri (von Rosen) as described by Silvestri (1914).

NEW GENUS, WITH ITS TYPE SPECIES

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NEW SPECIES, SUBSPECIES, AND VARIETIES WITH THEIR TYPE
LOCALITIES

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KEY TO THE GENERA AND SUBGENERA OF TERMITES RECORDED FROM
THE BELGIAN CONGO AND CAMEROON BASED ON THE CHARACTERS
OF THE SOLDIER CASTE

- 1.—Soldier caste present.....2.
 Soldier caste absent.....*Anoplotermes*.
- 2.—Mandibles usually conspicuous, functional and not degenerate.....3.
 Mandibles not conspicuous, degenerate and nonfunctional. Head prolonged into
 a nose-like projection in front.....38.
- 3.—Head without a fontanelle or frontal gland. Eyes always present behind the
 bases of the antennæ, about the same size as the base of the antennæ.
 Mandibles toothed.....4.
 Fontanelle and frontal gland nearly always present. Eyes, if present, repre-
 sented only by small dots much smaller than the base of the antennæ.
 Mandibles toothed or untoothed.....6.
- 4.—Head short, only a little longer than wide; front ridged and deeply lobed.
 Mandibles short. Head partially or wholly black.....*Cryptotermes*.
 Head elongated and yellowish. Mandibles normal.....5.
- 5.—Antennæ with 11–12 segments. Forehead fairly steep and somewhat lobed.
 *Glyptotermes*.
 Antennæ with 15–17 segments.....*Neotermes*.
- 6.—Mandibles used for biting, usually curved inwards at the tip.....7.
 Mandibles used for snapping, either elongate and slender or asymmetrical...36.
- 7.—Tip of labrum with a hyaline point.....8.
 Tip of labrum without a hyaline point.....14.
- 8.—Two projecting spines on the anterior margin of the pronotum. Antennæ
 with 18–20 segments.....9.
 Anterior margin of pronotum without projecting spines.....10.
- 9.—Projecting spines on the sides of the meso- and metanotum...*Acanthotermes*.
 No projecting spines on the sides of the meso- and metanotum.
 *Pseudacanthotermes*.
10. Antennæ with 13 segments.....11.
 Antennæ with 15 segments.....*Synacanthotermes*.
 Antennæ with 16–17 segments.....12.
- 11.—Sides of head and labrum rounded.....*Sphærotermes*.
 Sides of head and labrum nearly straight.....*Pseudomicrotermes*.
- 12.—Large species, head over 4 mm. long including the mandibles.....13.
 Small species, head under 3 mm. in length including the mandibles.
 *Alloodontermes*.

- 13.—Head dark, sides strongly converging toward the front... *Macrotermes*, s. str.
 Head yellowish, sides conspicuously converging toward the front... *Hepilitermes*.
 Head yellowish, sides nearly parallel..... *Bellicositermes*.
- 14.—Inner margins of mandibles finely serrated throughout..... *Microcerotermes*.
 Inner margins of mandibles without conspicuous teeth on the anterior half,
 sometimes with minute dentations but usually smooth..... 15.
 Inner margins of mandibles with conspicuous teeth on the anterior half... 30.
- 15.—Opening of frontal gland very wide and close to the base of the clypeus.
Coptotermes.
 Opening of frontal gland not as above..... 16.
- 16.—Opening of frontal gland thickly surrounded with a small bunch of hair... 17.
 Opening of frontal gland without a thick bunch of hair..... 24.
- 17.—Pronotum very wide, as wide or nearly as wide as the head. Styli present.
Thoracotermes.
 Pronotum not proportionately wide..... 18.
- 18.—Mandibles bent outwards near the middle forming an elbow..... *Ophiotermes*.
 Mandibles not curving outwards..... 19.
- 19.—Labrum distinctly forked with a deep notch in the middle of the anterior
 margin..... 20.
 Labrum not distinctly forked and anterior margin without a deep notch... 22.
- 20.—Labrum large and fleshy..... *Euchilotermes*.
 Labrum not particularly large and not fleshy..... 21.
- 21.—Antennæ with 14 segments. Sometimes the forehead is not evenly rounded and
 in some cases the gula possesses a projection..... *Proculitermes*.
 Antennæ nearly always with 15 segments; forehead evenly curved; mandibles
 always of medium thickness and evenly curved..... *Cubitermes*.
 Antennæ with 15 segments; forehead rather sharp; front margin of pronotum
 deeply emarginate..... *Trichotermes*.
- 22.—Front of head prolonged into a very large conspicuous nose; head rectangular.
Tuberculitermes.
 Front of head prolonged into a very large conspicuous nose; sides of head
 rounded..... *Proboscitermes*.
 Front of head not prolonged into a nose; sides of head straight and parallel.
Orthotermes.
 Front of head not prolonged into a large conspicuous nose; head with sides
 rounded..... 23.
- 23.—Front of head overlapping base of mandibles..... *Fastigitermes*.
 Front of head not overlapping base of mandibles..... *Basidentitermes*.
- 24.—Labrum with anterior margin straight; mandibles slender..... 25.
 Labrum with anterior margin rounded or pointed..... 26.
- 25.—Fontanelle on the horizontal part of the head..... *Apilitermes*.
 Fontanelle on the sloping part of the forehead..... *Crenatermes*.
- 26.—Mandibles heavy and thick..... 27.
 Mandibles slender..... 29.
- 27.—Head with distinct ridges over the antennæ bases; labrum minute. *Jugositermes*.
 Head without distinct ridges over the antennæ bases; labrum of normal size. 28.

- 28.—No projection in the region at the fontanelle.....*Apicotermes*.
 A short projection in the region of the fontanelle.....*Ceratotermes*.
 29.—Mandibles strongly curved at the tips.....*Ancistrotermes*.
 Mandibles only slightly curved at the tips.....*Microtermes*.
 30.—Antennæ with 12 segments.....*Cephalotermes*.
 Antennæ with 13–18 segments.....31.
 31.—Left mandible with two or more teeth.....32.
 Left mandible with one conspicuous tooth.....34.
 32.—Left mandible with two sharp distinct teeth. Two soldier castes.
Schedorhinotermes.
 Left mandible with a number of small teeth. One soldier caste.....33.
 33.—Antennæ with 14 segments.....*Protermes*, s.str.
 Antennæ with 16–17 segments.....*Allodontermes*.
 34.—Antennæ with more than 15 segments (few exceptions).
Termes, s.str. and *Cyclotermes*.
 Antennæ with 13–15 segments.....35.
 35.—Tooth on each mandible forming a sharp angle posteriorly...*Amitermes*, s.str.
 Tooth on each mandible not forming a sharp angle posteriorly.
Hoplognathotermes.
 36.—Mandibles extremely asymmetrical.....*Pericapritermes*.
 Mandibles elongate, slender; not particularly asymmetrical.....37.
 37.—Head prolonged in front into a sharp nose; sides of head parallel.
Mirotermes, s.str.
 Head not prolonged into a sharp nose; sides of head converging toward the
 front.....*Promirotermes*.
 38.—Two distinct soldier castes; mandibles without points.....*Trinervitermes*.
 One distinct soldier caste.....39.
 39.—Head with a distinct lateral constriction.....40.
 Head without a constriction.....41.
 40.—Nose roughened, in contrast to smooth vertex.....*Eutermellus*.
 Nose and vertex smooth.....*Coarctotermes*.
 41.—Mandibles without points; small species.....*Subulitermes*.
 Mandibles with well-developed sharp points.....*Nasutitermes* s.str.

KALOTERMITIDÆ

The species belonging to this family are nearly always found burrowing in hard wood and never found constructing large, conspicuous nests. Thus they are often overlooked by the general collector. The social life of this group is the most primitive known and is quite distinct from the *Hodotermitidæ* which I am considering as a family.

Two genera are found in the Ethiopian region, only one of which has been reported from the West African subregion. The other, *Porotermes*, is recorded from South Africa. *Porotermes* can be distinguished from *Calotermes* by the triangular arrangement of the spines on the hind tibiæ of all castes. *C. amabilis* Sjöstedt has this character and there seems to be every reason for believing that it is the imago of *P. plani-*

ceps as suggested by Fuller (1921*b*, p. 31.) I see no characters of generic or subgeneric value to distinguish *P. planiceps* from the South American and Australian species of *Porotermes*.

KALOTERMES Hagen

This genus is known from every region, although it is confined to the southern portions of the Nearctic and Palearctic regions. It is divided into a number of subgenera, some of which have been considered of generic rank by recent authors. Five subgenera are found in the Ethiopian region.

Three subgenera have been reported from the Cameroon and Belgian Congo (*Neotermes*, *Cryptotermes* and *Glyptotermes*), but only *Neotermes* is represented in the collections before me.

Subgenus **NEOTERMES** Holmgren

A single specimen of an imago is the only representative of this subgenus found in the collections. It is rather interesting, however, in that it does not run to any genus in Holmgren's (1911) key, owing to the fact that the pulvillus is lacking. Otherwise, however, it runs readily to the subgenus *Neotermes*. Dr. T. E. Snyder writes me that he has also found a species thought to be a *Neotermes* which lacks the pulvillus. In addition to the new species described below, four species of *Neotermes* have been reported from the West African subregion, all except one known in the imago caste.

Kalotermes (Neotermes) sepulvillus, new species

Text Figure 1

IMAGO.—Head medium brown, oval, flat on top. Antennæ with 18 segments. Eyes fairly large, black, .22 mm. from the lower margin of the head. Ocelli fairly large, touching the eye. Pronotum wider than the head, front margin concave, hind margin weakly emarginate. Sides rounded, not converging toward the rear. Pronotum same color as the head. Three large spines at the end of the tibiae of all the legs, the tips of the spines dark. Tibiæ darker in color than the femora. Tarsi without pulvilli. Wings characteristic of the subgenus *Neotermes*. The basal third chitinated and dark, the outer two-thirds hyaline. The costa, radius and media light. Cubitus almost invisible. Media肘ed near the base.

Length with wings.....	13.70 mm.
Length without wings.....	9.00
Length of head.....	2.20
Width of head.....	1.78
Length of antennæ.....	2.55
Diameter of eye.....	0.55

Length of pronotum.....	1.00
Width of pronotum.....	2.00
Length of hind tibia.....	1.33
Length of anterior wing.....	10.28
Width of anterior wing.....	2.78

Differs from Holmgren's (1911) description of the genus in the absence of pulvilli. Otherwise it falls easily into the subgenus *Neotermes*.

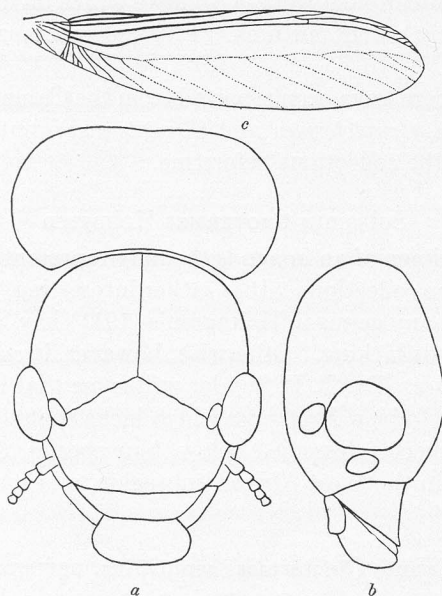


Fig. 1. *Kalotermes (Neotermes) sepulvillus*, new species.
a, head and pronotum of imago from above; b, head of imago from the side; c, anterior wing.

K. athii, *K. camerunensis*, *K. firmus*, *K. gracilidens* and *K. nigeriensis* are larger. *K. agilis* is smaller and the antennæ have 16 segments. *K. europæ* has 21 segments in the antennæ. In *K. gestri* the ocelli are smaller and farther from the eyes. *K. laticollis* is larger and has 20–21 segments in the antennæ. *K. pallidicollis* is larger and the pronotum is light yellow. *K. præcox* is smaller. *K. erythræus* is very close but the eye is more nearly circular and the pronotum is not as concave in front.

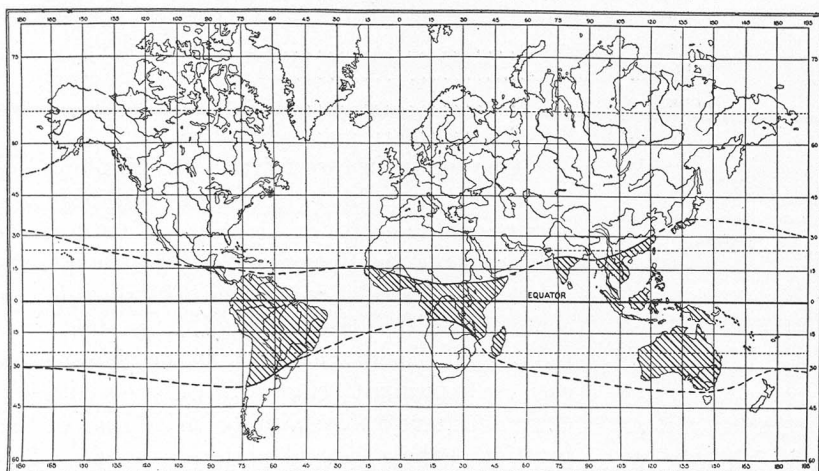
Type Locality.—Stanleyville, Belgian Congo: No. 990, Lang-Chapin Coll., February, 1915.

Holotype.—Winged imago, A. M. N. H.

The description is based on a single winged imago.

RHINOTERMITIDÆ

This family is represented in the Ethiopian region by only four genera, of which one (*Psammotermes*) is found in the arid regions of south Africa, the shores of the Red Sea, Algeria and Senegal. *Leucotermes* has recently been reported from Abyssinia by Sjöstedt (1926), this being the first record of this genus in the Ethiopian region. I am placing *Leucotermes* in synonymy with *Heterotermes* Froggat. *Coptotermes* and the subgenus *Schedorhinotermes* of the genus *Rhinotermes* are both found in the Cameroon and Belgian Congo.



Map 3. Distribution of the genus *Coptotermes*.

COPTOTERMES Wasmann

This is a tropicopolitan genus but in Africa no records had been established south of latitude 20° south on the east coast (Map 3) until Fuller (1925a) reported a species, in all probability recently introduced in South Africa. It will be interesting to see whether, in this case, this genus can establish itself outside of its ordinary range.

The genus *Vastitermes* described by Sjöstedt (1926) is without doubt synonymous with *Coptotermes*. This imago is distinct from known African imagos of *Coptotermes* in specific characters however.

It is difficult to determine the species of *Coptotermes* with accuracy because of the very slight variability. A number of species have been described from the Ethiopian region, the characters largely being the number and relative length of the antennal segments of the soldier. These characters will probably break down in a large series.

Coptotermes sjöstedti Holmgren

Text Figure 2

SOLDIER.—Head yellow, sparsely covered with long bristles; narrowing in front, sides and posterior margin rounded. Antennæ with 13 segments, the third very short and the line of division from the fourth very weak. Labrum triangular, pointed, with a few long bristles. Thorax lighter in color than the head. Pronotum weakly emarginate behind, sides rounded, covered with numerous bristles. Abdominal tergites covered with numerous bristles; lighter than head.

Length of head.....	1.63–1.77 mm.
Width of head.....	0.97–1.00
Length of antennæ.....	1.22
Length of pronotum.....	0.38–0.40
Width of pronotum.....	0.70
Length of hind tibia.....	0.76–0.83
Length of left mandible.....	0.67–0.72

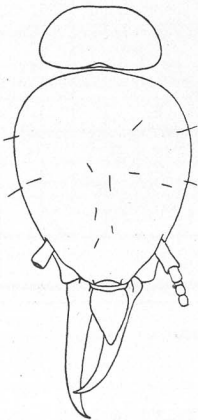


Fig. 2. *Coptotermes sjöstedti* Holmgren.

Head and pronotum of soldier from above.

One soldier in the vial from Senegambina has the second and third segments of the antennæ about equal in length and is thus not distinguishable from the description of *C. sjöstedti* var. *subintacta*. One soldier in the vial from Bipindi also conforms to the description of *C. sjöstedti* var. *subintacta*. The other soldiers in the vials in each case are typically *C. sjöstedti*. Cotype soldiers of *C. amanii* have a more acutely angled head at the junction of the sides and posterior margin. The profile of *C. amanii* is more flatly arched, but the gula is similar.

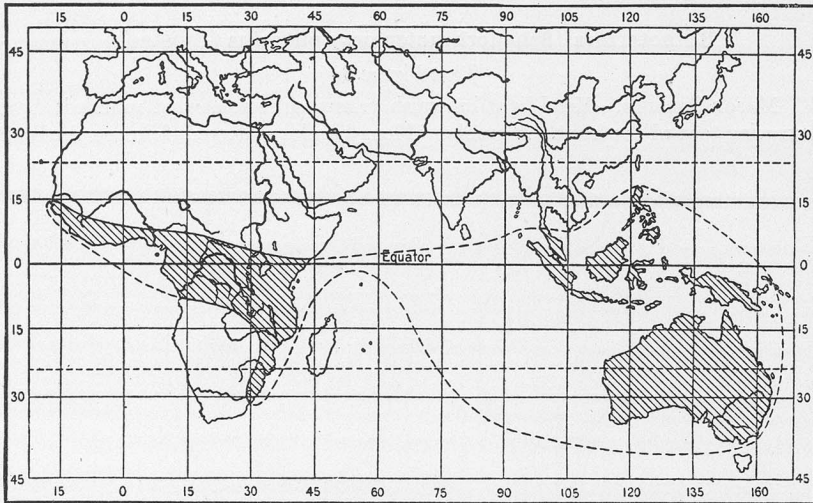
Localities.—Lolodorf, Cameroon: Anna Lehman Coll., No. 44, 1918. Senegambina, Cameroon: B. C. Z. Evans Coll., No. 292, April 28, 1920. Bipindi, Cameroon: G. Zenker Coll., No. 64, 1920.

The description is based upon numerous soldiers.

RHINOTERMES Hagen

This genus is nearly tropicopolitan in its distribution. The most specialized of the subgenera (*Rhinotermes*, *s.str.*) is confined to the Neotropical region and is remarkable for the great modification of the minor soldier. This caste has reduced, functionless mandibles, while the labrum is greatly elongated and forked at the tip and is used for the dissemination of the liquid from the frontal gland which rolls down the median groove to the tip.

The subgenus *Schedorhinotermes* is distributed over the greater parts of the tropics of the Old World (Map 4) and also possesses two distinct soldier castes. The minor soldier of *Schedorhinotermes* still retains functional mandibles and the labrum is not quite as elongated and slender as that found in *Rhinotermes*, *s.str.* The minor soldier probably functions in much the same way in the two subgenera.



Map 4. Distribution of the subgenus *Schedorhinotermes*.

Subgenus **SCHEDORHINOTERMES** Silvestri

The distribution of this subgenus is singular in that no records occur from the Malagasy region and from India and Ceylon (Map 4). Three species recently reported by Snyder from the Solomon Islands and Santa Cruz Archipelago are not included in the map. The record of *R. magnificus* from Lower Burma is also probably north of the range shown on the map.

Two species and one variety are represented in the collections before me. I think that the subspecies *australis* of *R. putorius* recently described by Fuller is a variety of *R. lamanianus*, making the total number of species known from the Ethiopian region two, with three varieties.

Following is a key to the species known from the Belgian Congo, based on the characters of the major soldier.

- 1.—Width of head 2.1–2.2 mm.; posterior angles of head widely rounded.

R. (Schedorhinotermes) lamanianus var. *bequaertianus*.

- Width of head 2.0 mm. or under. 2.

- 2.—Bristles on head, thorax and abdomen absent or very minute.....3.
Bristles conspicuous on the head, thorax and abdomen.

R. (Schedorhinotermes) putorius.

- 3.—Width of head 2.0 mm.; sides rather strongly converging toward the front;
pronotum relatively long.

R. (Schedorhinotermes) lamanianus var. *angulatus.*

- Width of head 1.7–1.8 mm.; sides only slightly converging toward the front;
pronotum relatively short.....*R. (Schedorhinotermes) lamanianus.*

Rhinotermes (Schedorhinotermes) putorius (Sjöstedt)

Text Figure 3

MAJOR SOLDIER.—Head light brownish yellow, sides somewhat rounded; head narrowing toward the front. A number of long bristles scattered about on the head.

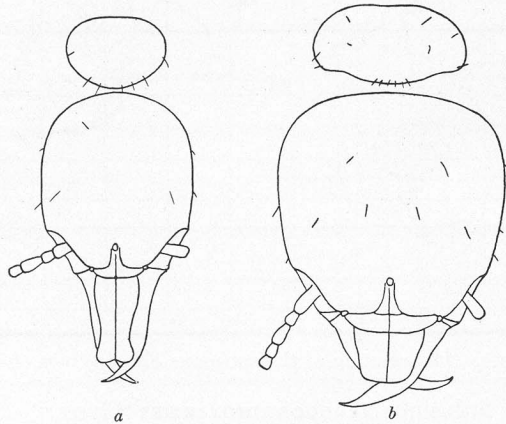


Fig. 3. *Rhinotermes (Schedorhinotermes) putorius* (Sjöstedt).

a, head and pronotum of minor soldier from above; *b*, head and pronotum of major soldier from above.

Antennæ with 16 segments, the third segment $1\frac{1}{2}$ times the length of the second segment. Labrum wide with anterior margin somewhat rounded. Mandibles similar to those of *R. lamanianus*. Thorax light brownish yellow. Pronotum with several bristles on the anterior lobe and a few more scattered around the margin and in the middle. Sides of pronotum rounded, posterior margin slightly emarginate, anterior margin with a distinct lobe. Bristles conspicuous on the posterior margins of the abdominal tergites. Abdomen light brownish yellow.

Length of head to tip of labrum.....	2.22 mm.
Width of head.....	1.78–1.80
Length of antennæ.....	2.11–2.22
Length of pronotum.....	0.64–0.66
Width of pronotum.....	1.11–1.16
Length of hind tibia.....	1.55–1.67
Length of left mandible.....	1.00–1.10

The specimens before me answer the descriptions of both the major and minor soldiers except in size. Sjöstedt (1900, p. 52) gives the measurement of the head with mandibles as 2.2 mm. in the major soldier and the length of the mandibles as 0.7 mm. *R. lamanianus* var. *australis* is larger but Fuller (1921) does not mention the pilosity. The head of *R. putorius* is narrower than *R. lamanianus* var. *angulatus*. *R. putorius* differs from both *R. lamanianus* and var. *angulatus* in the presence of bristles on the head, thorax and abdomen.

MINOR SOLDIER.—Head subrectangular, sides somewhat rounded, posterior margin rounded. A few long bristles scattered over the head. Antennæ with 14–15 segments. Labrum and mandibles similar to *R. lamanianus*. Pronotum suboval, posterior margin evenly rounded, a few bristles scattered around the margin. Abdominal tergites with long conspicuous bristles on the posterior margins.

Length of head to tip of labrum.....	1.44 mm.
Width of head.....	0.80
Length of antennæ.....	1.68
Length of pronotum.....	0.38
Width of pronotum.....	0.55
Length of hind tibia.....	1.05
Length of left mandible.....	0.67

WORKER.—Antennæ with 16 segments, the third longer than the second, the second longer than the fourth.

Length of head.....	1.44–1.55 mm.
Width of head.....	1.33

Localities.—Bipindi, Cameroon: G. Zenker Coll., No. 23, 1920. Avakubi, Belgian Congo: Lang-Chapin Coll., No. 21, Nov. 11, 1909.

The description is based on two major soldiers from Bipindi and numerous minor soldiers from both of the above-mentioned localities. The specimens from Avakubi were preserved in the same vial with *Nasutitermes* (*N.*) *incurvus* (Sjöstedt).

Rhinotermes (Schedorhinotermes) lamanianus (Sjöstedt)

Text Figure 4

MAJOR SOLDIER.—Head yellow, sides nearly straight. No bristles present on the head. Antennæ with 16 segments, the third segment $1\frac{1}{2}$ times as large as the second. Labrum wide, anterior margin slightly rounded. Left mandible with two conspicuous large teeth. Right mandible with one large tooth. The opening of the frontal gland conspicuous, a groove extending from the opening to the tip of the labrum. Thorax yellow. No conspicuous bristles present on the pronotum. Sides of pronotum somewhat rounded, posterior margin nearly straight or very slightly emarginate. No bristles on the margins of the abdominal tergites.

Length of head to tip of labrum.....	2.05-2.30 mm.
Width of head.....	1.72-1.78
Length of antennæ.....	2.33
Length of pronotum.....	0.69-0.72
Width of pronotum.....	1.30-1.38
Length of hind tibia.....	1.67
Length of left mandible.....	1.00-1.10

The specimens before me correspond exactly to the description of *R. lamanianus* except that the pronotum in neither the major nor the minor soldier is conspicuously "eingebuchtet." Differs from *R. putorius* in the pilosity and from *R. lamanianus* var. *angulatus* in the shape of the head and pronotum.

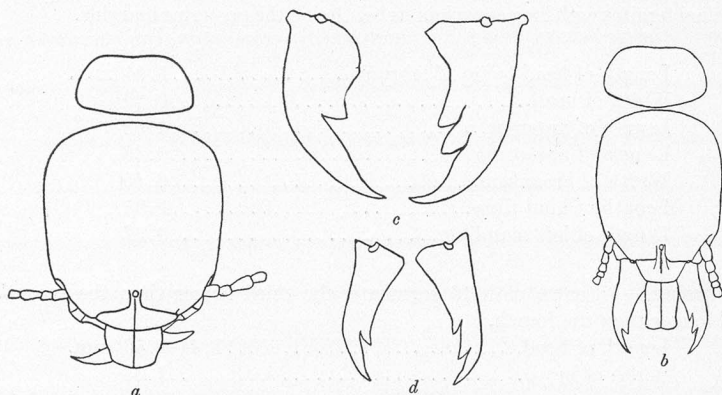


Fig. 4. *Rhinotermes* (*Schedorhinotermes*) *lamanianus* (Sjöstedt.)

a, head and pronotum of major soldier from above; b, head and pronotum of minor soldier from above; c, mandibles of major soldier; d, mandibles of minor soldier.

MINOR SOLDIER.—Head without conspicuous bristles, sides subparallel, posterior margin rounded. Antennæ with 15-16 segments, the second, third and fourth subequal when there are 15 segments, the fourth small when there are 16 segments. Pronotum with rounded sides, posterior margin nearly straight, with no conspicuous bristles. Abdominal tergites with no long bristles.

Length of head to tip of labrum.....	1.68 mm.
Width of head.....	0.89
Length of antennæ.....	1.67
Length of pronotum.....	0.44
Width of pronotum.....	0.78
Length of hind tibia.....	1.16-1.22
Length of left mandible.....	0.67-0.72

WORKER.—Antennæ with 16-17 segments.

Length of head.....	1.67-2.00 mm.
Width of head.....	1.55

Locality.—Malela, Belgian Congo: No. 960, Lang-Chapin Coll., July 8, 1915.

The description is based on numerous specimens of each caste.

A number of lepidopterous larvæ of the genus *Plastopolypus* Silvestri were found by Lang with this termite. Silvestri (1920) recently described this termitophilous genus from the larvæ only, tentatively placing it in the family Tineidæ, and including two species in the genus. The species, so far, have only been reported as termitophiles in the nests of *Schedorhinotermes*. The species of *Plastopolypus* found with *R. lamanianus* in Malela differs specifically from the two species already described, *P. divisus* and *P. integer*. However, it is not thought wise to describe the species from the larvæ alone. Lang made the following observations in the field on the termites and caterpillars. "Living in channels of mangrove decomposed entirely like dry mustard. The Tineidæ were crawling along with the termites." An examination of the stomach contents of the caterpillars showed no insect remains but only what seemed to be vegetable débris. Dr. W. T. Forbes of Cornell University, however, to whom I gave some of the specimens for examination stated that the mandibles seemed to be adapted for the predaceous habit. He also stated that he did not believe that the larvæ belonged to the Tineidæ.

***Rhinotermes* (*Schedorhinotermes*) *lamanianus* (Sjöstedt) var.**

***angulatus*, new variety**

Plate XX; Text Figure 5

MAJOR SOLDIER.—Head yellow, proportionately wide, sides rounded. No bristles present on the head. Antennæ with 16–17 segments. If with 17 segments, the third is only slightly longer than the second. If with 16 segments, the third is much longer than the second or fourth. Labrum wide, anterior margin slightly rounded. Mandibles similar to those of *R. lamanianus*. Thorax yellow. Pronotum with no conspicuous bristles. Sides and posterior margin of pronotum nearly straight, hind angles rounded, anterior margin evenly rounded. Abdominal tergites with no conspicuous bristles on the margins.

Length of head to tip of labrum.....	2.44 mm.
Width of head.....	2.00
Length of antennæ.....	2.44
Length of pronotum.....	0.76–0.78
Width of pronotum.....	1.33–1.44
Length of hind tibia.....	1.68–1.80
Length of left mandible.....	1.00–1.10

R. lamanianus var. *bequaertianus* is larger. Also, the prothorax of var. *bequaertianus* is described as "oval-rectangular," while this variety

would seem to be more angular. The shape of the head and pronotum is different from the typical *R. lamanianus*. The pilosity is different from *R. putorius*. *R. lamanianus* var. *australis* must be close, but Fuller's description is too meagre for determination.

MINOR SOLDIER.—Sides of head somewhat rounded, converging toward the front. No conspicuous bristles on the head, abdomen or pronotum. Antennæ with 15–16 segments. Sides of pronotum nearly straight, posterior margin nearly straight or very slightly emarginate.

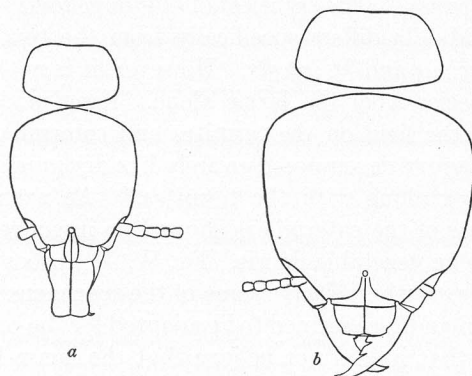


Fig. 5. *Rhinotermes* (*Schedorhinotermes*) *lamanianus* var. *angulatus*, new variety.
a, head and pronotum of minor soldier from above; b, head and pronotum of major soldier from above.

Length of head to tip of labrum.....	1.89 mm.
Width of head.....	1.11
Length of pronotum.....	0.55
Width of pronotum.....	0.89
Length of hind tibia.....	1.33
Length of left mandible.....	0.78

WORKER.—Antennæ with 16–17 segments.

Length of head.....	1.67–1.78 mm.
Width of head.....	1.55

Type Locality.—Niapu, Belgian Congo: Lang-Chapin Coll., No. 682, Nov. 8, 1914.

Holotype.—Major soldier (A. M. N. H.).

Morphotype.—Minor soldier (A. M. N. H.).

Described from numerous major and minor soldiers and workers.

“These yellow termites were found in irregular black tunnels (Plate XX) alongside the bark of trees” (Lang, from field notes).

TERMITIDÆ

This is the largest family of termites and it is the most specialized. Holmgren (1910) first distinguished the family and his classification has been generally accepted. His name *Metatermitidæ*, however, does not follow the rules of nomenclature, as already pointed out by Banks and Snyder (1920) and Light (1921a).



Map 5. Distribution of the genus *Acanthotermes*.

Fifty genera and subgenera of this family are represented in the Ethiopian region, many of them forming the conspicuous nests noticed by travellers throughout the region. The habits are very varied, some of the genera cultivating fungi on their excrement, some feeding entirely on grass or leaves, and others feeding on wood.

ACANTHOTERMES Sjöstedt

This genus is distributed in a wide belt across equatorial Africa (Map 5) and is confined entirely to the Ethiopian region. Seven species

have been described, of which three are represented in the collections before me. For the present I am regarding *Pseudacanthotermes* as a subgenus.

The genus as a whole seems to be successful in Rain Forests as well as in the Savanna. Large fungus gardens are found in the nests (Plates XXII and XXIII).

Subgenus **ACANTHOTERMES** Sjöstedt

Sjöstedt (1924a) has placed *A. acanthothorax* as the only species of this genus, the rest of the species formerly included being placed in the genus *Pseudacanthotermes*.

Acanthotermes (Acanthotermes) acanthothorax (Sjöstedt)

Text Figure 6

MAJOR SOLDIER.—Head reddish yellow, heart-shaped. Sides fairly straight, converging anteriorly. Forehead and labrum same color as rest of head. Fontanelle with small spine. Antennæ with 17 segments, the third about the same length as the

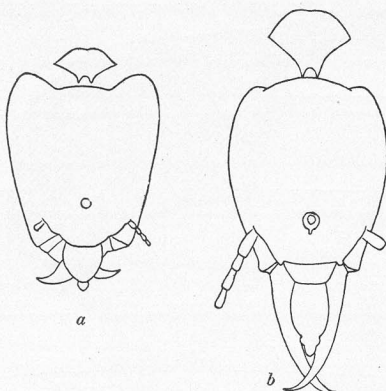


Fig. 6. *Acanthotermes (Acanthotermes) acanthothorax* (Sjöstedt).
a, head and pronotum of major soldier ($\times 7.3$); b, head and pronotum of minor soldier ($\times 24$).

second and longer than the fourth. Labrum with hyaline point, narrowed anteriorly. Mandibles darker than the head. Lateral spines on meso- and metanota pointing somewhat to the rear. Posterior margin of metanotum straight. Sides of pronotum sharply pointed, two spines on anterior margin pointing forward.

Total length.....	8.00–8.10 mm.
Length of head.....	3.67–4.90
Width of head.....	2.36–3.40
Length of antennæ.....	2.67
Length of pronotum.....	0.52–0.78
Width of pronotum.....	1.05–1.49
Length of hind tibia.....	1.92–2.33
Length of left mandible.....	1.48–1.55

MINOR SOLDIER.—Head with a tendency to be heart-shaped; sides rounded, not converging very much toward the front. Fontanelle conspicuous with circular raised portion and a distinct spine in front of the opening. Antennæ with 15 segments, the third longer than the second. Labrum elongate with a 3-lobed hyaline point.

Length of head.....	2.00–2.10 mm.
Width of head.....	0.89–0.94
Length of pronotum.....	0.38–0.44
Width of pronotum.....	0.46–0.50
Length of hind tibia.....	1.16–1.33
Length of left mandibles.....	0.89–1.00

Two other sizes of intermediate soldiers were found in one vial from the stomach contents of *Bufo funereus* from Akenge. Sjöstedt (1926) described five types of soldiers. An examination of this material revealed the fact that the C-form of the major soldier was parasitized by a larva similar in appearance and position to those described from the Orient by Kemner (1925, 1925a) and Silvestri (1926) infesting the herds of *Macrotermes* soldiers. Also I believe that Sjöstedt's B-form of the major soldier is also parasitized although I could not see the larva in the dried specimen. It is to be hoped that a careful study of this interesting parasite will not be long delayed.

Localities.—Senegambina, Cameroon: B. C. Z. Evans Coll., No. 255, April 25, 1920. Babeyru, Belgian Congo: Lang-Chapin Coll., No. 766, July, 1914. Stanleyville, Belgian Congo: H. Kohl Coll., No. 54TZ. Akenge, Belgian Congo: Lang-Chapin Coll., stomach contents, Nos. 8532–8533, *Bufo funereus*, September, 1913.

All of the localities from which this species has been taken are within or close to the borders of the West African Rain-forest.

"Termites live in decomposed moist wood on the ground" (Lang, from field notes).

Subgenus **PSEUDACANTHOTERMES** Sjöstedt

Acanthotermes (Pseudacanthotermes) spiniger (Sjöstedt)

Plates XXI and XXIII, Figure 2; Text Figure 7

IMAGO.—Head dark brown, mandibles yellowish with black tips. Antennæ with 23 segments, the second longer than the third, the third and fourth equal. Eyes relatively small, as far from the lower margin as from the ocelli. Ocelli elongate from above, oval from the side, more than their diameter from the eyes. Labrum yellowish. Postclypeus yellowish, contrasting with the head; a line through the middle. Anterior margin of the pronotum emarginate in the middle, sides straight and converging toward the rear, posterior margin widely emarginate. Posterior margins of the meso- and metanota widely concave. Wing membrane light and transparent. Costal margin, radius and basal veins opaque brown to yellow. The outer portions of the media and cubitus just visible, the media not running parallel to the radius and with numerous branches.

Length with wings.....	29.00 mm.
Length without wings.....	15.00
Length of head.....	2.78
Width of head.....	2.20-2.30
Length of antennæ.....	3.80
Diameter of eye.....	0.53-0.55
Length of pronotum.....	1.27
Width of pronotum.....	2.00-2.20
Length of hind tibia.....	3.00
Length of left mandible.....	1.33
Length of anterior wing.....	22.00-23.00
Width of anterior wing.....	5.50
Length of queen.....	52.00
Width of abdomen of queen.....	17.00

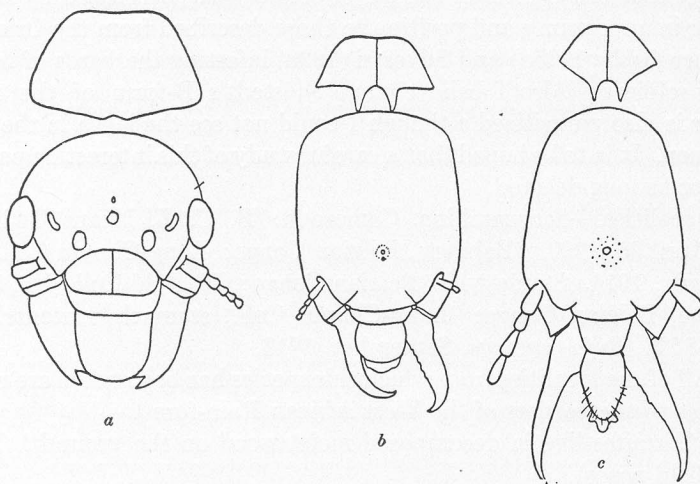


Fig. 7. *Acanthotermes* (*Pseudacanthotermes*) *spiniger* (Sjöstedt).
a, head and pronotum of imago from above; b, head and pronotum of major soldier from above; c, head and pronotum of minor soldier from above.

Close to *A. militaris* but differs in the small eye farther removed from the ocelli.

MAJOR SOLDIER.—Head rectangular, reddish yellow brown. Antennæ with 19-21 segments. Labrum wide with hyaline tip. Mandibles black, the left coarsely dentate. Fontanelle surrounded by short hairs and a spine in front. Meso- and metanota with pointed sides but with no lateral spines. Pronotum with two large spines on the anterior margin, the sides sharply pointed and converging toward the rear.

Length of head.....	3.67-4.00 mm.
Width of head.....	1.83-2.10
Length of pronotum with spines.....	1.00
Length of pronotum in middle.....	1.67
Width of pronotum.....	1.30-1.60
Length of hind tibia.....	2.00-2.20
Length of left mandible.....	1.33-1.37

I am unable to distinguish the subspecies *kohli* and *lujæ* in the material before me. So much overlapping of characters occurs that it seems to me we are dealing with a variable species.

The length of head with mandibles of a cotype of *A. unsgaardi* is 3.67 mm. and one cotype of *A. spiniger* measures the same. I am placing *A. unsgaardi* in synonymy with *A. spiniger*. I also find major soldiers of topotype material of subspecies *maynei* from Eala with both twenty and twenty-one segments in the antennæ and see no reason for the separation of these forms.

MINOR SOLDIER.—Antennæ with 20 segments, the third much longer than the second, and second shorter than the fourth.

Length of head.....	2.40-2.60 mm.
Width of head.....	1.10
Width of pronotum.....	0.78
Length of pronotum with spines.....	0.60
Length of pronotum in middle.....	0.44
Length of hind tibia.....	1.89
Length of left mandible.....	1.10

MAJOR WORKER.—Antennæ with 21 segments.

Length of head.....	2.30 mm.
Width of head.....	2.00

Localities.—Poko, Belgian Congo: Lang-Chapin Coll., No. 613, Aug., 1913. Stanleyville, Belgian Congo: Lang-Chapin Coll., No. 990, Feb. 15, 1915; No. 8406, 1915, stomach contents of *Bufo regularis*, Aug. 29, 1909; No. 824, Feb. 1915; H. Kohl Coll., No. 20bT; No. 20T; No. Kl 8; No. 39T; No. 46TZ; No. 46TZc; No. 46TZc; 9 other vials with no numbers. Avakubi, Belgian Congo: Lang-Chapin Coll., No. 1, Oct. 22, 1909; No. 22, Nov. 11, 1909; No. 35, Dec. 5, 1909. Niangara, Belgian Congo: Lang-Chapin Coll., No. 598, May 20, 1913; stomach contents of *Hemisus marmoratum*, June, 1913. Garamba, Belgian Congo: Lang-Chapin Coll., No. 8416, May, 1912, stomach contents of *Bufo regularis*. Also in vials of stomach contents, Lang-Chapin Coll., No. 226, No. 38.

The nests of these fungus-growing termites are large (Plate XXI, fig. 1). The natives of this region (Avakubi) catch the termites for food. Mr. Lang gives the following description of the method used. Plate XXI, fig. 2 shows the removed cone of the termite nest as it is wrapped by the natives.

"The cone is surrounded by leaves, in order to collect the winged individuals. As soon as the hill is surrounded, the termites fill out the slight interstices, and actually build the inner leaves into their cone without destroying the leaves. There is always a pocket on the side and a cover on top (missing in the photograph). The pocket at the side, that serves as a receptacle, was also cut off before the photograph was taken. The natives watch the process closely (the swarm takes place on certain evenings, never on rainy days, they say). When the termites begin to swarm, they find no exit, and drop in masses into the pocket from which the natives take them."

Dr. Bequaert gives the following account (1921). "Shortly before the termites' seasonal flight is due, as indicated a couple of days previous by the sporadic escape of a few winged individuals, the termitarium is 'fixed up' (Plate XXI, fig. 2).

"The 'cap' was removed from the top of the nest before the photograph was made in order to show how the layers of these impermeable, green, marantaceous leaves are arranged. Such a waterproof cover of leaves must produce inside the termitarium changed conditions of temperature and moisture. At any rate, the termite workers came forth as if the walls were injured and needed repair. They soon fill in the interstices between the leaves and termitarium. Only after the leaves dry do the termites cover them also from the outside with particles of soil and destroy them.

"The termitarium being covered with green leaves, these termites, when swarming on certain evenings and late into the night, can find no immediate exit. As soon as a few finally manage to escape, the natives fix near the point of emergence a sort of reversed funnel-shaped pocket (not shown in the picture), also fashioned with leaves. Through it the masses of winged individuals, struggling madly among themselves to escape, drop easily into holes made in the ground or often into baskets set up and lined with smooth leaves. The natives, who watch every promising nest closely, remove them at once and kill them by moving a sieve over a smoky fire, in the process of which the wings are also eliminated. The wings come off so easily that many individuals when crowding from the exits after a number of fruitless attempts to take wing, have to crawl off wingless without ever getting a chance to fly."

Acanthotermes (Pseudacanthotermes) militaris (Hagen)

Plate XXII; Text Figure 8

IMAGO.—Head dark brown, contrasting with postclypeus. Fontanelle small. Antennæ of female with 21 segments and antennæ of male with 20 segments. Eyes large, not prominent, .13 mm. from the lower margin. Ocelli small, .13 mm. long and .13 mm. removed from the eye. Labrum yellowish with light transverse band. Postclypeus yellowish with dark median line. Pronotum same color as the head. Anterior margin with two raised pointed processes; hind margin weakly cut. Meso- and metanota with sharp posterior angles and the hind margins widely emarginate. Costal border and radius of wings yellow; membrane hyaline; other veins inconspicuous except near the suture.

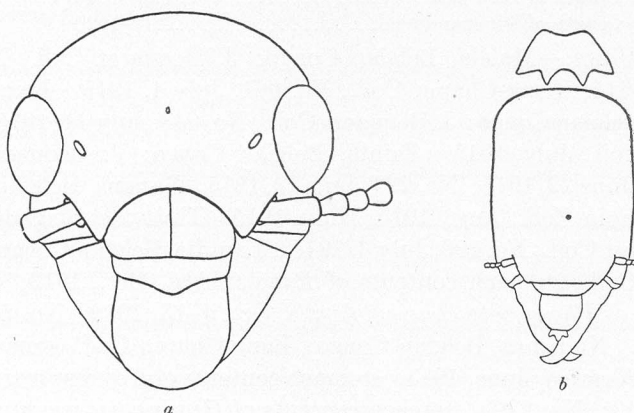


Fig. 8. *Acanthotermes (Pseudacanthotermes) militaris* (Hagen).
a, head of imago from above; b, head and pronotum of major soldier from above.

	MALE	FEMALE
Length with wings.....	22.50–24.00 mm.	26.00–26.50 mm.
Length of head.....	2.40	2.57– 2.70
Width of head.....	2.00	2.15– 2.20
Length of pronotum.....	1.05	1.28– 1.45
Width of pronotum.....	1.80	2.15– 2.30
Length of hind tibia.....	2.25	2.57– 2.80
Length of anterior wing.....	17.80	21.20–22.30
Width of anterior wing.....		5.08

MAJOR SOLDIER.—Head reddish yellow; rectangular; sides very slightly rounded and not converging much toward the front. Antennæ with 18 segments, the third longer than the second, the second longer than the fourth. Labrum with a three-lobed hyaline point. Mandibles dark brown. Fontanelle a small rather inconspicuous dot. Pronotum with two long pointed spines on the anterior margin; sides fairly straight and strongly converging toward the rear; posterior margin concave.

Length of head.....	4.60-5.10 mm.
Width of head.....	2.50-2.60
Length of pronotum.....	1.20-1.35
Width of pronotum.....	1.90-2.08
Length of hind tibia.....	2.00-2.50
Length of left mandible.....	1.50

MINOR SOLDIER.—

Length of head.....	2.50-2.85 mm.
Width of head.....	1.20-1.50
Length of pronotum.....	0.57-0.70
Width of pronotum.....	0.80-1.00
Length of hind tibia.....	1.40-1.60
Length of left mandible.....	1.17-1.20

Localities.—Malela, Belgian Congo: J. Bequaert Coll., No. 237, July 4, 1915; Lang-Chapin Coll., No. 961, July 4, 1915. Kunga, near Malela, Belgian Congo: J. Bequaert Coll., No. 248, July 11, 1915; Lang-Chapin Coll., July, 1915. Zambi, Belgian Congo: J. Bequaert Coll., No. 222, June 22, 1915; No. 223, June 22, 1915. Banana, Belgian Congo: Lang-Chapin Coll., Aug., 1915; July, 1915. Thysville, Belgian Congo: J. Bequaert Coll., No. 190, July 3, 1915. Faradje, Belgian Congo: Lang-Chapin Coll., stomach contents of *Rana christzi*, Oct., 1912; stomach contents of *Phrynobatrachus natalensis*, Oct. 1-15, 1912; No. 535, Oct. 28, 1912. Niangara, Belgian Congo: Lang-Chapin Coll., stomach contents of *Kassina*, June, 1913; stomach contents of *Hemisis marmoratus*, June, 1913; No. 2299, stomach contents of *Hemisis marmoratus*, June, 1913. Medje, Belgian Congo: Lang-Chapin Coll., stomach contents, No. 3114, of *Cardioglossa*, June, 1914. Senegambina, Cameroon: B. C. Z. Evans Coll., No. 341, May 6, 1920.

This termite also builds large nests and cultivates fungi on its excrement (Plate XXII). A minute ant, *Pædalagus termitolestes* Wheeler, was taken near the fungus gardens shown in the photograph.

Mr. Lang observed a swarm of winged individuals of this species emerging about 3 P.M. in great masses from holes in a road. The termites emerged four or five at a time in the bright sunlight. These observations were made at Kunga in July, 1915.

PROTERMES Holmgren

This genus was designated by Holmgren (1910a) with the type species *P. prorepens* (Sjöstedt). It thus has priority over *Allodontermes* Silvestri described in 1912. *Allodontermes* is here considered a subgenus of *Protermes* with *P. (Allodontermes) schultzei* (Silvestri) as the type species. Both groups are confined to the Ethiopian region.

Subgenus **PROTERMES**, *s.str.*

Two species of this subgenus are represented in the collections.

I am unaware of any recorded observation of any fungus-growing habit among the species of this subgenus, and believe that Father Kohl's notes in the following pages are the first record. *Allodontermes* is known to grow fungus.

Protermes (Protermes) prorepens (Sjöstedt)

Text Figure 9

SOLDIER.—Head yellow; sides only slightly rounded, parallel; clothed with very few bristles. Antennæ with 14 segments, the third and fourth very small and equal, the second as long as the third and fourth together. Labrum tongue-shaped. Fontanelle inconspicuous. Front margin of the pronotum somewhat emarginate.

Length of head.....	1.50-1.63 mm.
Width of head.....	0.77-0.87
Length of pronotum.....	0.36
Width of pronotum.....	.53-0.63
Length of hind tibia .....	.61-0.73
Length of left mandible.....	.47-0.57

Locality.—Avakubi, Belgian Congo: No. 22 Lang-Chapin Coll., Nov. 11, 1909.

The description is based on a few soldiers preserved in a vial with *Acanthotermes spiniger*.

Protermes (Protermes) hirticeps Sjöstedt

Text Figure 10

SOLDIER.—Head covered with hairs and bristles; yellow; sides slightly rounded, converging somewhat in front. Antennæ with 14 segments, third sometimes showing signs of dividing, second usually nearly as long as the third and fourth together. Gula very wide. Labrum long, rounded at tip. Fontanelle inconspicuous. Front margin of the pronotum emarginate.

Length of head.....	1.83 mm.
Width of head.....	1.05
Length of pronotum.....	0.50
Width of pronotum.....	0.83
Length of hind tibiæ.....	0.90
Length of left mandible.....	0.63

Conspicuously larger than *P. prorepens*. Head proportionately wider and covered with hairs and bristles. The specimens agree with Sjöstedt's cotypes. The minor soldier described by Sjöstedt is a species of *Microtermes*, however.

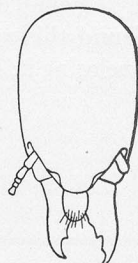


Fig. 9. *Protermes (Protermes) prorepens* (Sjöstedt).

Head of soldier from above.

Localities.—Garamba, Belgian Congo: Lang-Chapin Coll., July, 1912. St. Gabriel near Stanleyville, Belgian Congo: No. 9T Kohl Coll., July 21, 1909.

Described from seven soldiers from the stomach contents of *Cardioglossa* taken in Garamba and from numerous soldiers collected at St. Gabriel.

Following is a translation of field notes made by Father Kohl: "I found this variety of termites in our vegetable garden, near the hedge enclosing it, directly beneath the surface, perhaps 3 cm. below in the soil.

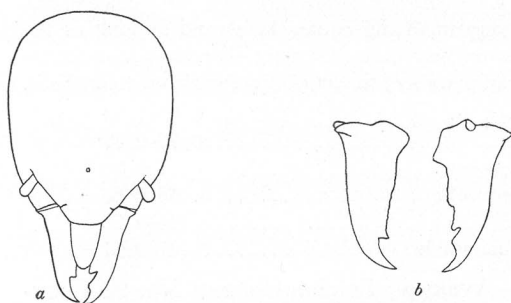


Fig. 10. *Protermes (Protermes) hirticeps* Sjöstedt.

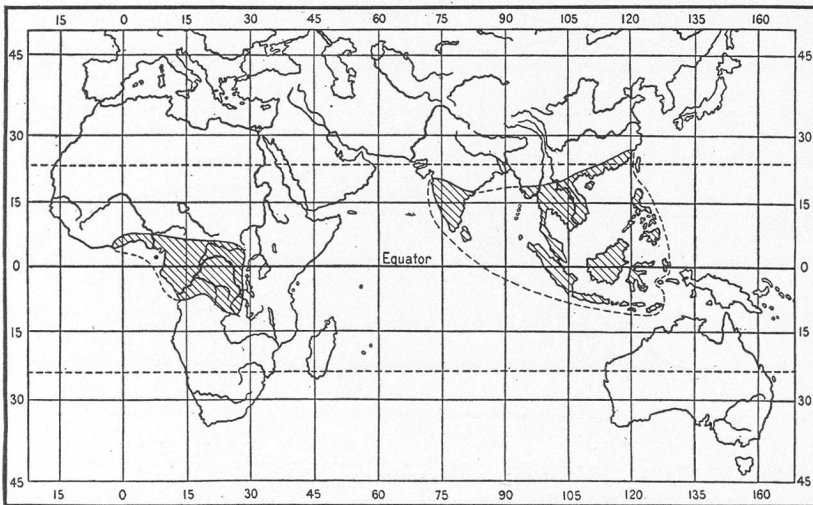
a, head of soldier from above; *b*, mandibles of soldier.

There I found one fungus chamber next to another in large numbers. The fungus gardens in these chambers might have been about 17 cm. high with a diameter of 10 cm. They were occupied by soldiers, workers and larvæ. These fungus gardens were as large as the chambers which contained them. Most of the fungus gardens, of an elliptical shape, contained a nucleus, harder than the mass around it, lying detached from this mass like a kernel; this kernel, too, was studded with funguli and adhered to the base. When the observer annoys the soldiers, or breathes on them, they emit a white secretion.

MACROTERMES Holmgren

This genus contains some of the largest of known species of termites, including the well-known species *M. bellicosus* Smeathman. Holmgren (1912) has referred to this genus under the name *Termes* and included *Macrotermes* as a subgenus. Fuller (1921) and others have not followed Holmgren in the name of this genus because the Linnean type, *Termes fatale*, certainly did not belong here but probably belongs to the genus

designated by Holmgren as *Odontotermes*, if, indeed, it can be treated as a valid species. Thus, Fuller elevated the subgeneric name *Macrotermes* to include the entire genus and the name *Odontotermes* has been discarded for the name *Termes* as explained in the following pages. Fuller did not see fit, however, to rename the subgenus *Termes* of Holmgren's. As I thought this subgenus distinct from *Macrotermes* as outlined by Holmgren, I suggested the name *Bellicositermes* with *M. bellicosus* Smeathman as the type species (Emerson, 1925). Sjöstedt (1926) has proposed the name *Amplitermes* for this group, giving it generic rank. *Amplitermes* is thus a synonym of *Bellicositermes* as pointed out by



Map 6. Distribution of the subgenus *Macrotermes*, s.str.

Sjöstedt (1926, p. 366). Careful examination of both Oriental and African species, however, indicates no particular differences that warrant separation into subgenera or genera. For the purpose of this paper, however, I am retaining the subgeneric distinctions.

All these termites grow fungus on their excrement and their nests often form conspicuous features of the landscape (Plates XXIII, fig. 1; XXIV; XXVI).

Subgenus **MACROTERMES**, s. str.

This subgenus seems to be confined to the rain-forest regions of the Old World (Map 6) and has not been able to penetrate the savannah regions to any great extent. Two species are represented in the collections.

Macrotermes (Macrotermes) lilljeborgi (Sjöstedt)

Text Figure 11

MAJOR SOLDIER.—Head black, conspicuously narrowed in front. Antennæ with 17 segments, the second very short, the fourth about twice as long as the second, the third longer than the fourth. Labrum black with a long pointed hyaline tip. Mandibles black, without teeth in the anterior portion, right mandible very conspicuously wider than the left. Fontanelle inconspicuous, represented by a depression in the middle of the head. Pronotum lighter than the head, borders dark; front margin emarginate; sides converging toward the rear; hind margin somewhat concave. A

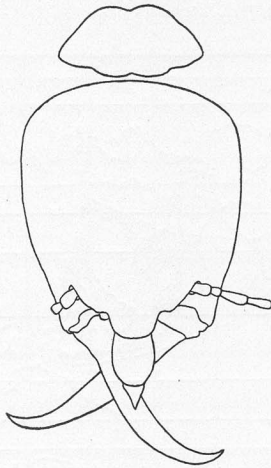


Fig. 11

Fig. 11. *Macrotermes (Macrotermes) lilljeborgi* (Sjöstedt).
Head and pronotum of major soldier.

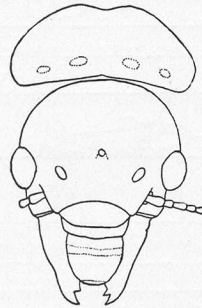


Fig. 12

Fig. 12. *Macrotermes (Macrotermes) gabonensis* (Sjöstedt).
Head and pronotum of imago.

more or less light mark in the middle of the pronotum, but the series of light marks do not form a cross as in *M. gabonensis*. Abdominal tergites the same color as the sternites.

Length of head.....	10.28 mm.
Width of head.....	5.67
Length of antennæ.....	6.74
Length of pronotum.....	1.77
Width of pronotum.....	3.55
Length of hind tibia.....	5.32
Length of left mandibles.....	4.14

The mesonotum is proportionately wider than in *M. gabonensis* and the head is darker.

MINOR SOLDIER.—Antennæ with 17 segments, the third and fourth equal.

Length of head.....	5.44 mm.
Width of head.....	2.60
Length of pronotum.....	1.30
Width of pronotum.....	2.00
Length of hind tibia.....	4.49
Length of left mandibles.....	2.60

Locality.—Senegambina, Cameroon: Nos. 327, 330, B. C. Z. Evans Coll., May 4, 1920. Described from six major soldiers and 10 minor soldiers.

Macrotermes (Macrotermes) gabonensis (Sjöstedt)

Text Figure 12

IMAGO.—Head black; oval; fontanelle dark, only visible by a depression in the head. Antennæ with 19 segments, the third longer than the second, the second equal to the fourth. Eyes of medium size, not prominent. Ocelli .45 mm. long and .48 mm. from the eyes. Labrum tongue-shaped, lighter than the head; a band across the middle and the tip white. Postclypeus same color as the head, median line not conspicuous. Pronotum wider than the head and proportionately short; hind margin emarginate; four light spots near the anterior margin. Meso- and metanota with widely concave posterior margins. Wings smoky, veins conspicuous.

	MALE	FEMALE
Length with wings.....	41.00 mm.	44.00 mm.
Length without wings.....	18.00	19.00
Length of head.....		4.73
Width of head.....	4.20	4.14
Diameter of eye.....		1.12
Length of pronotum.....		1.77
Width of pronotum.....		4.45
Length of left mandible.....		2.13
Length of anterior wing.....		34.00
Width of anterior wing.....		9.00
Length of queen.....		64.00
Width of abdomen of queen.....		15.00

The winged specimens from Batama are lighter in color than the specimens from Medje and are also slightly smaller. It may be that they are different forms, but hardly deserve subspecific rank.

MAJOR SOLDIER.—Head very dark red brown, almost black; conspicuously narrowed in front; sides nearly straight. Antennæ with 18 segments, the third nearly double the length of the fourth, the second shorter than the fourth. Labrum dark brown with a long pointed hyaline tip. Mandibles black, the left wider than the right. Fontanelle a small inconspicuous dot. Pronotum with a light line down the middle and with two fairly distinct light spots on each side, together forming a cross-shaped mark. Abdominal tergites much darker than the sternites.

Length of head.....	8.86-9.18 mm.
Width of head.....	4.96-5.95
Length of pronotum.....	1.54-1.83
Width of pronotum.....	3.43-3.58
Length of hind tibia.....	5.07-5.32
Length of left mandible.....	3.19-3.58

The soldiers from Batama and Lukolela are smaller in general than those from Medje, while those from Niangara are between.

M. lilljeborgi has a darker head, the sides of the head are more rounded, the marks on the pronotum are different and the size is larger. *M. nobilis* has shorter mandibles.

Localities.—Medje, Belgian Congo: Nos. 169, 170, Lang-Chapin Coll., Sept. 19, 1910. Niangara, Belgian Congo: No. 222, Lang-Chapin Coll., Nov., 1910; stomach contents of *Bufo funereus*, Nos. 8555, 8558, Lang-Chapin Coll., April-June, 1910. Batama, Belgian Congo: Lang-Chapin Coll., Sept. 17, 1909. Lukolela, Belgian Congo: Lang-Chapin Coll., July 18, 1909. Akenge, Belgian Congo: stomach contents of *Bufo funereus*, Nos. 8539-8542, Lang-Chapin Coll., Oct., 1913. Bafwabaka, Belgian Congo: stomach contents of *Bufo tuberosus*, Lang-Chapin Coll. Gamangui, Belgian Congo: stomach contents of *Cardioglossa*, No. 341, Lang-Chapin Coll., Feb., 1910. Region of Stanleyville, Belgian Congo: Nos. 10T, 25T, 46TZb, 46TZd, 53TZ oben, 90TZ and many other unnumbered vials, Kohl Coll.

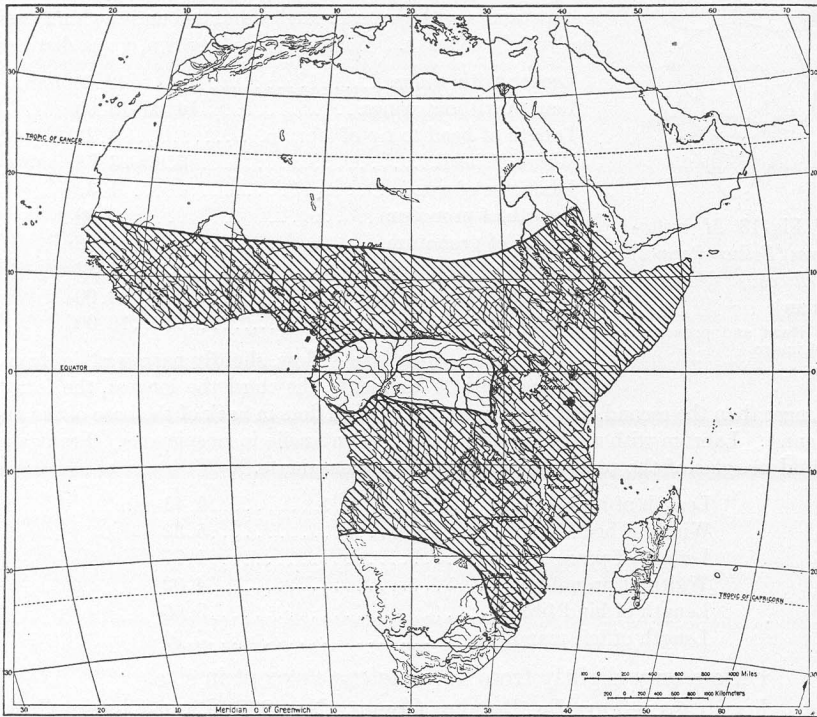
The descriptions are based on many winged imagos, queens, soldiers and workers.

Winged imagos were collected on September 16, 1909, near Batama and on September 19, 1910, at Medje by Mr. Lang.

Under the date of September 17, 1909 at Batama, Mr. Lang writes as follows: "The medium-sized black-headed individuals (soldiers) make a curious noise, when disturbed, by tapping their heads in unison against dead leaves. These sounds appear doubly strange since they are produced in wave-like succession with great harmony, as if hundreds of fine shot were dropped on stiff paper. During this performance the smaller soldiers sit on the under or upper side of leaves lying about the ground. The larger soldiers pinch terribly when touched and, when forcing their mandibles together, secrete a milky juice that accumulates at the tips of the pinchers. This secretion has no effect on human beings, even though their skin may be pierced."

Subgenus **BELlicosITERMES** Emerson

This subgenus was first named by me (1925) in a report on the termites of British Guiana. I am not sure that the group is sufficiently distinct to warrant subgeneric rank. It is confined entirely to the Ethiopian region and seems to be particularly adapted to the savannah regions, although here and there it has crept into the rain-forest (Maps



Map 7. Distribution of *Macrotermes (Bellicositermes) bellicosus* (Smeathman).

7 and 8). Sjöstedt (1904) has recorded *M. bellicosus* from Madagascar but I believe this record needs confirmation. All the other known species are found within the range of *M. bellicosus* and *M. natalensis* as plotted on the maps.

Sjöstedt (1926) records the following localities for *M. natalensis* which extend the range shown by Map 8: Eritrea; Brit. E. Africa-Lumbwa; Senegal-Dakar; Nigeria-Ibadan; Congo-Matele, Bania, Nola, Bikoro, Luebo, Yakoma, Manyema, Dungu.

Macrotermes (Bellicositermes) bellicosus (Smeathman)

Text Figure 13

IMAGO.—Head oval; front brown, posterior portion a little lighter; fontanelle inconspicuous. The third segment of the antennæ largest, the second equal to the fourth. Eyes large. Ocelli large, .58 mm. long and .13 mm. from the eye. Labrum yellowish with a light transverse band. Postclypeus lighter than the head, with a median line. Pronotum same color as head, with light marks; hind margin weakly concave. Meso- and metanota with posterior angles rounded and the hind margins widely concave. Wings yellowish brown, veins distinct.

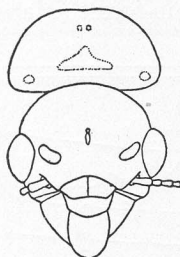


Fig. 13. *Macrotermes (Bellicositermes) bellicosus* (Smeathman).

Head and pronotum of imago.

Length with wings.....	42.00 mm.
Length without wings.....	14.00–15.00
Length of head to tip of labrum.....	4.25
Width of head.....	3.66– 3.78
Diameter of eye.....	1.32
Length of pronotum.....	1.89
Width of pronotum.....	3.55
Length of hind tibia.....	5.32
Length of queen.....	80.00
Width of abdomen of queen.....	16.00

SOLDIER.—Head red-yellow, slightly narrowed in front. Antennæ with 17 segments, the third the longest, the fourth longer than the second. Eyes represented by small dots in back of the base of the antennæ. Labrum with a large hyaline point. Fontanelle inconspicuous. Front and hind margins of the pronotum conspicuously emarginate.

Length of head.....	9.45 mm.
Width of head.....	5.32
Length of pronotum.....	1.77
Width of pronotum.....	4.02
Length of hind tibia.....	3.66
Length of left mandible.....	5.91

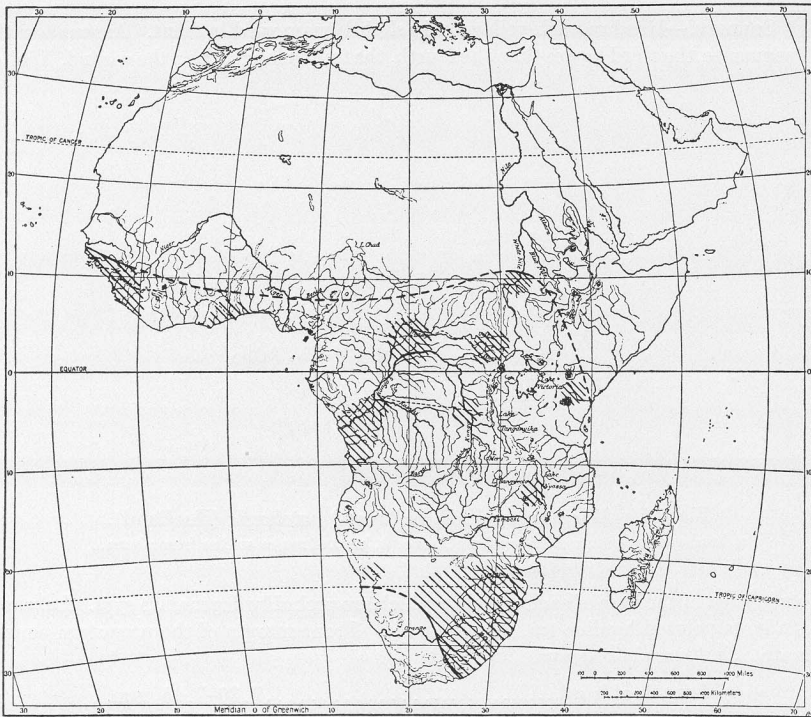
Differs only slightly from *M. natalensis* except in size.

Localities.—Faradje, Belgian Congo: No. 258, Lang-Chapin Coll., March, 1911; No. 271, Lang-Chapin Coll., April, 1911; No. 349, Lang-Chapin Coll., February, 1912; stomach contents of *Rana occipitalis*, No. 2149, Lang-Chapin Coll., October 16, 1912. Niangara, Belgian Congo: Nos. 219, 220, Lang-Chapin Coll., Nov., 1910. Garamba, Belgian Congo: stomach contents of *Bufo regularis*, Nos. 8418, 8419, Lang-Chapin Coll., May, 1912. Efulen, Cameroon: Acc. 4794, Carnegie Mus., H. L. Weber Coll., Oct. 26, 1912.

The descriptions are based on many kings, queens, major soldiers, minor soldiers and workers from the above-mentioned localities, together with two winged imagos from Efulen, Cameroon.

This species seems to be largely confined to the savannah region (Map 7) and has not invaded the rain-forest to any great extent. Few African species have as great a range and none are so well known.

Major soldiers, minor soldiers and workers were found in the stomachs of *Rana occipitalis* and *Bufo regularis* taken at Faradje and Garamba respectively.



Map 8. Distribution of *Macrotermes (Bellicositermes) natalensis* (Haviland).

***Macrotermes (Bellicositermes) natalensis* (Haviland)**

Plates XXIII, Figure 1; XXIV; XXV; XXVI; Text Figure 14

IMAGO.—Head dark brown, oval; fontanelle inconspicuous, same color as head. The third segment of the antennæ longest, the second and the fourth equal. Eyes rather large, oval. Ocelli .165 mm. long and .096 mm. from the eyes. Labrum yellowish with a narrow transverse white band. Postclypeus lighter than the head, with a dark median line. Pronotum same color as the head, with light marks. The hind margins of the meso- and metanota widely concave, angles rounded.

Length of head to tip of labrum.....	3.79 mm.
Width of head.....	3.19
Diameter of eye.....	1.13
Length of pronotum.....	1.65
Width of pronotum.....	3.07
Length of hind tibia.....	3.70
Length of left mandible.....	1.65
Length of queen.....	101.00
Width of abdomen of queen.....	31.00

SOLDIER.—Head reddish yellow, only slightly narrowed in front. Antennæ with 17 segments, the third longer than the fourth, the fourth longer than the second. White

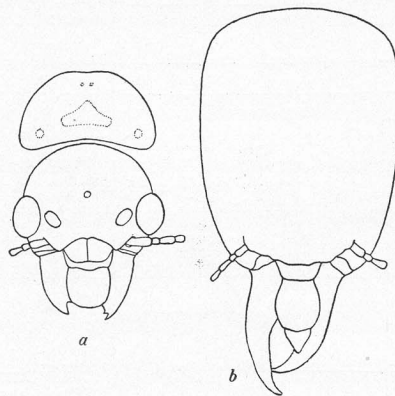


Fig. 14. *Macrotermes (Bellicositermes) natalensis* (Haviland).
a, head and pronotum of imago from above; b, head of major soldier from above.

dots in back of the base of each antennæ which are probably degenerate eyes. Labrum with large pointed hyaline tip, sides rounded. Front margin of the pronotum emarginate; hind margin concave.

Length of head.....	7.30–7.45 mm.
Width of head.....	3.78–4.26
Length of pronotum.....	1.18–1.30
Width of pronotum.....	2.72–2.95
Length of hind tibia.....	2.95–3.19
Length of left mandible.....	2.36–2.48

Localities.—Yakuluku, Belgian Congo: No. 302, Lang-Chapin Coll., Dec., 1911; August 3, 1911, Lang-Chapin Coll. Garamba, Belgian Congo: No. 370, Lang-Chapin Coll., March 14, 1912. Niangara, Belgian Congo: Nos. 221, 222, 223, Lang-Chapin Coll., Nov., 1910; Nos. 596, 597, 598, 599, Lang-Chapin Coll., May, 20, 1913; stomach contents of *Hemisus marmoratus*, Lang-Chapin Coll., June, 1913. Faradje, Belgian

Congo: No. 319, Lang-Chapin Coll., Dec., 1911; No. 334, Lang-Chapin Coll., February, 1912; No. 531, Lang-Chapin Coll., Jan., 1913. Kwamouth, Belgian Congo: Lang-Chapin Coll., July 14, 1909. Boma, Belgian Congo: Lang-Chapin Coll., June 18, 1915.

The descriptions are based on many kings, queens and soldiers.

The nests of this species are sometimes tall and conical (Plate XXIII, fig. 1 and Plate XXIV) and are sometimes large, mound-like structures



Map 9. Distribution of *Sphaeroterme sphaerotherax* (Sjöstedt).

covered with grass (Plate XXVI), which are so numerous as to be of considerable geological importance at Niangara where the photograph was taken. Wheeler (1922) reports an ant, *Carebara osborni*, living in cleptobiosis in these nests. A species of the same genus, *Carebara winifredæ*, was found by me in the nest of *Syntermes snyderi* in British Guiana (previously determined as *Syntermes dirus* and so reported by Wheeler).

Following are extracts from Lang's valuable field notes pertaining to this species.

"No. 596. Termites from hills overgrown with grass covering a large area behind the post of Niangara. They are all overgrown with grass and situated in an almost treeless plain that is very marshy during the rainy season (Plate XXVI). The abundance of these hills may best be seen in the photograph. The queen was found in a chamber about three feet above the level ground near the center of a medium-sized structure. There were large hollow chambers throughout except near the more solid surface."

Mr. Lang collected one of the queen chambers at Faradje (Plate XXV, fig. 2) which measured on the inside 214 mm. in length and 114 mm. in width. He states that "the queen was about 110 mm. long and laid about one egg every second when taken from the termite hill." At Niangara he also found a single chamber containing three large queens (Plate XXV, fig. 1) with their heads all pointed in the same direction.

SPHÆROTERMES Holmgren

This monotypic genus seems to be confined to the rain-forest of the Congo basin and its borders (Map 9). Practically nothing is known concerning the habits of the species. As it is related to the fungus-growing species, I expect that it will be found to possess this habit, but no observations have been made of its habits so far as I know.

Up to the present time no specimens of the reproductive castes or winged imagos have been described. Rev. H. Kohl collected near Stanleyville the kings and queens upon which the following description is based.

Sphærotermes sphærothorax (Sjöstedt)

Text Figure 15

IMAGO.—Head light brownish yellow; oval; fontanelle a round light dot and rather small; head covered with short hairs and a few long bristles. The third segment of the antennæ very small, the fourth about equal to the second. Eyes of medium size, round, not particularly close to the lower margin. Ocelli large, very close to the eyes. Labrum light, fairly transparent. Postclypeus the same color as the head, median line present; about as long as one-half the width. Pronotum light yellow, a little lighter than the head; sides rounded; anterior and posterior margins emarginate; covered with short hairs and long bristles. Posterior margins of the meso- and metanota widely emarginate. Legs light yellow, all the tibiæ with two apical spines. Abdominal tergites light yellow. Styli absent in both the male and female.

Length of head.....	1.27-1.28 mm.
Width of head.....	1.13-1.20
Diameter of eye.....	0.30-0.31
Length of pronotum.....	0.60
Width of pronotum.....	0.97-1.07
Length of hind tibia.....	1.20-1.23
Length of left mandible.....	0.57
Length of queen.....	26.00
Width of abdomen of queen.....	5.00

SOLDIER.—Head rectangular with rounded angles, only slightly narrowed in front; reddish yellow; covered with short hair. Antennæ with 13 segments, the third smaller than the second, the second equal to the fourth. Labrum with rounded sides and a hyaline point. Left mandible with a much stronger curved point than the

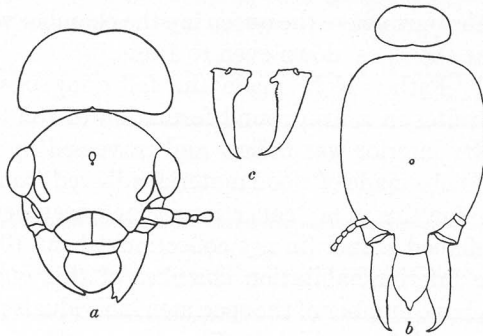


Fig. 15. *Sphærotermes sphærothorax* (Sjöstedt).

a, head and pronotum of imago from above; *b*, head and pronotum of soldier from above; *c*, mandibles of soldier.

right, a few serrations and a blunt tooth near the base. Inner margin of the right mandible smooth. Fontanelle in the middle of the head, small and inconspicuous. Pronotum with a somewhat emarginate front margin; hind margin slightly concave.

Length of head.....	1.79-1.83 mm.
Width of head.....	0.96-1.00
Length of antennæ.....	1.03-1.10
Length of pronotum.....	0.33-0.37
Width of pronotum.....	0.57-0.60
Length of hind tibia.....	0.61-0.67
Length of left mandible.....	0.61

WORKER.—Antennæ with 13 segments.

Width of head.....	0.95 mm.
Length of hind tibia.....	0.67

Localities.—Bipindi, Cameroon: G. Zenker Coll., No. 64, 1920.
Thysville, Belgian Congo: J. Bequaert Coll., No. 186, June 3, 1915.

St. Gabriel near Stanleyville, Belgian Congo: H. Kohl Coll., Nos. 12 T, 17T, 23T, 55TZ unter.

The descriptions are based on two kings, two queens and numerous soldiers and workers from St. Gabriel near Stanleyville collected by Father Kohl, together with numerous soldiers and workers from the other localities. These are the first descriptions of the reproductive castes to be published.

Father Kohl made some interesting observations on the habits of this species. Under his number 12T, I find the following notes which have been translated from the German: "A negro boy brought me a fine queen's chamber of a variety of termites which live in dead wood. This chamber was 6 cm. long and 3½ cm. wide, and it is preserved in my collection. At the part where the queen lay the chamber was 8 mm. high, but was lower at the sides, down even to 1 mm."

Under 23T, Father Kohl made the following observations. "I found these termites in a firm round formation of soil 30 cm. long by 15 cm. wide. Its interior was hollow and traversed by roots to which small roundish knobs made of wood material adhered (fungus gardens?). There are roots like this in my collection. The queen herself was found in a hard ball-shaped kernel (in my collection) about 10 cm. long by 5 cm. high. The interior habitation chamber of this queen, which she occupied with a large number of the specimen individuals preserved in the glass tube, measured 4 mm. high by 7 cm. long. The kernel itself was situated at the center of the knot of roots. The large, more or less globular formation was composed of a mass of soil not as hard as the kernel, and had a diameter of about 3 cm. every way. It was traversed by small corridors in every direction. Part of this nest is preserved in my collection."

Dr. J. Bequaert states that the Thysville specimens were "from galleries in decaying wood, in a narrow gallery of forest in the grass country."

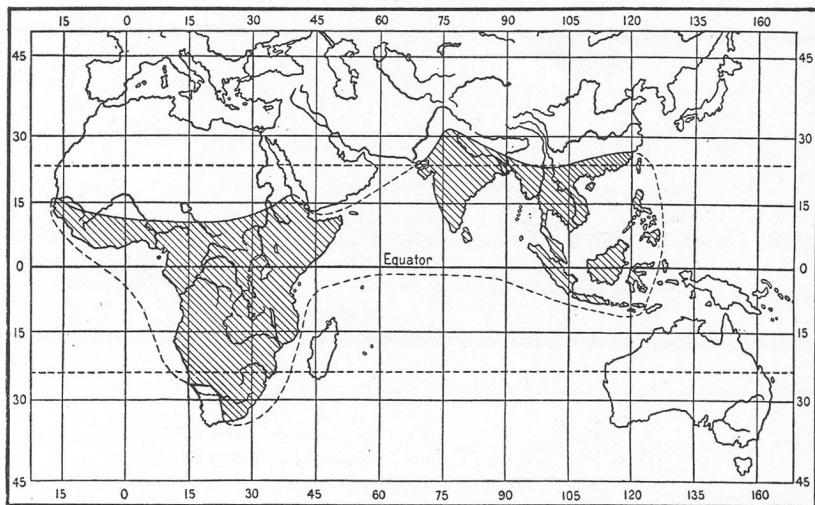
TERMES Linnæus

I am using the name *Termes* for Holmgren's genus *Odontotermes* and for the present am retaining his subgeneric divisions, although the typical subgenus seems to overlap *Cyclotermes* in a few cases and the group needs to be revised as a whole. Holmgren's type of *Odontotermes* is *Termes vulgaris* (1910a). Therefore, Fuller (1921) cannot use the name for a subgenus in which he does not include *T. vulgaris*. It seems best under the conditions to discard the name *Odontotermes* completely.

As *T. fatale* Linnæus seems to be a species not based upon an actual specimen, it probably has no validity and I am therefore treating *T. capensis* as the genotype for the reasons discussed by Fuller (1924d). The actual genotype is not a termite and therefore it seems to me necessary to arbitrarily establish *T. capensis* as the genotype as it is the only known termite recognized by Linnæus as belonging to *Termes*.

Subgenus **TERMES**, *s.str.*

This subgenus is spread over the greater part of the tropics in the Ethiopian and Indomalayan regions but so far has not been reported from Madagascar or the tip of Africa in the vicinity of the Cape of Good



Map 10. Distribution of the genus *Termes*.

Hope (Map 10). It also does not extend as far north on the coast of China and to Formosa as the map indicates for the entire genus, the records included in the map for this region belonging to *Cyclotermes*.

The species are difficult to determine and I imagine that a number of mistakes have crept into the literature owing to this fact. I have divided the forms before me into eleven species of which I am describing seven as new. Whether all are correctly determined can only be tested through the study of more extensive collections so that all the variations may be known. Unfortunately, the imagoes were not collected in the majority of cases.

So far as is known, all the species are extensive cultivators of fungus.

Termes (Termes) bequaerti, new species

Text Figure 16

SOLDIER.—Head large, reddish yellow; sides rounded and slightly converging toward the front; clothed with a few bristles near the front. Antennæ with 17 segments, the third smaller than the fourth, the fourth smaller than the second. Eyes represented by black dots behind the antennæ bases. Mandibles black except near the base. Dentation very similar to that of *T. schmitzi* but the mandibles are more slender. Anterior and posterior margins of the pronotum emarginate.

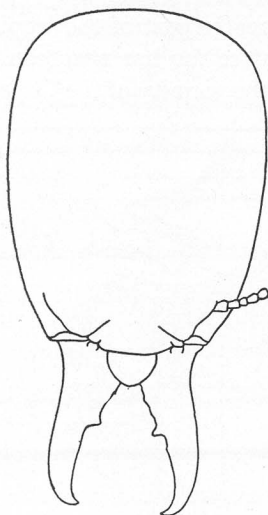


Fig. 16

Fig. 16. *Termes (Termes) bequaerti*, new species.

Head of soldier from above.

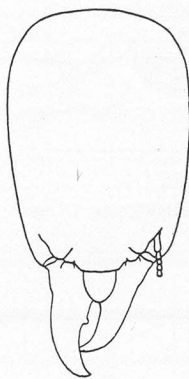


Fig. 17

Fig. 17. *Termes (Termes) stanleyvillensis*, new species.

Head of soldier from above.

Length of head with mandibles.....	6.21 mm.
Length of head to tip of labrum.....	4.25
Width of head.....	2.89
Length of antennæ.....	2.45
Length of pronotum.....	0.97
Width of pronotum.....	1.92
Length of hind tibia.....	2.27
Length of left mandible.....	1.84

Close to *T. schmitzi* but the sides of the head are more rounded and the mandibles more slender in *T. bequaerti*. *T. rectanguloides* is smaller.

T. badius has a somewhat wider head and the sides converge more toward the front. *T. monodon* cotype has a proportionately wider head and thicker mandibles.

Type Locality.—Thysville, Belgian Congo: No. 185, Bequaert Coll., June 4, 1915.

Holotype.—Soldier (Congo Museum, Tervueren).

Described from a few soldiers which were taken together with a few workers. I have named the species in honor of Dr. J. Bequaert.

“From galleries burrowed in clay soil, in a narrow belt of forest gallery in the grass country” (Bequaert’s field notes).

Termes (Termes) stanleyvillensis, new species

Text Figure 17

SOLDIER.—Head reddish yellow; sides somewhat rounded and converging slightly toward the front; bristles sparsely scattered over the head. Antennæ with 17 segments, the third smaller than the fourth, the fourth smaller than the second. Small slightly pigmented eye spots behind the bases of the antennæ. Light dots above the eye spots may be degenerate ocelli. Mandibles dark brown or black, dentation and thickness same as in *T. schmitzi*. Anterior and posterior margins of the pronotum emarginate.

Length of head.....	5.77 mm.
Width of head.....	3.15-3.24
Length of antennæ.....	3.06
Length of pronotum.....	1.09
Width of pronotum.....	2.15
Length of hind tibia.....	2.54
Length of left mandible.....	2.01-2.10

Very close to *T. schmitzi* and may only be a form of this species. *T. stanleyvillensis* has slightly more rounded sides of the head and is larger and the sides of the head converge a little more toward the front. Haviland’s specimens (Natal, 1894) of *T. badius* are smaller and the head is proportionately shorter. *T. monodon* has shorter mandibles.

Type Locality.—Region of Stanleyville, Belgian Congo: Kohl Coll.

Holotype.—Soldier (A. M. N. H.).

Described from many soldiers which were collected together with many workers.

Termes (Termes) schmitzi, new species

Text Figures 18 and 19

IMAGO.—Head brown; oval; rather thickly covered with long hairs. Fontanelle a small dot in the middle of the forehead. Antennæ with 19 segments, the third slightly smaller than the fourth, the fourth shorter than the second. Eyes rather large and fairly close to the lower margin of the head. Ocelli large in the male, less than their width from the eyes; smaller in the female, nearly their width from the eyes. Labrum with a light transverse band. Postclypeus much shorter than one-half its width; median line present. Pronotum nearly the same color as the head; sides

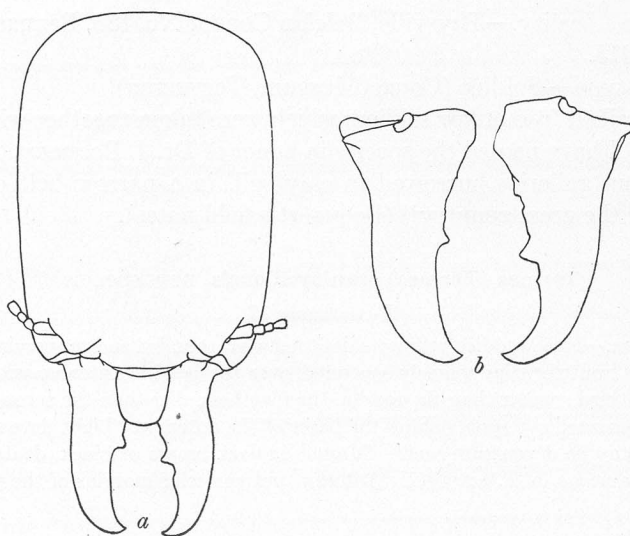


Fig. 18. *Termes (Termes) schmitzi*, new species.
 a, head of soldier from above; b, mandibles of soldier.

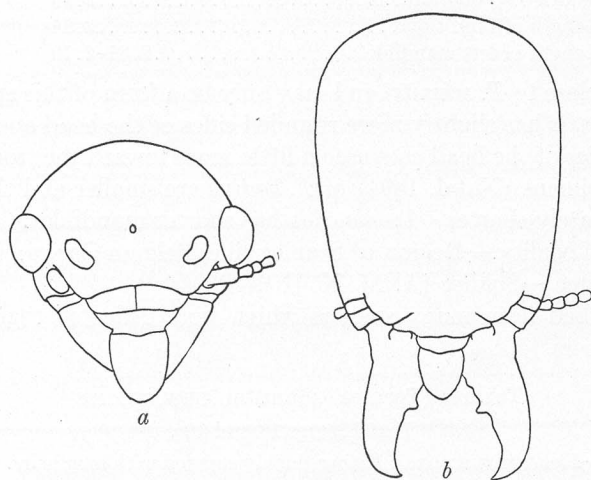


Fig. 19. *Termes (Termes) schmitzi*, new species.
 a, head of imago from above; b, head of soldier from above.

strongly converging toward the rear; angles rounded; posterior margin slightly emarginate; anterior margin emarginate. Posterior margins of the meso- and meta-nota widely emarginate, angles rounded. Wings yellow brown.

Length with wings.....	25.00-26.00 mm.
Length without wings.....	11.00-12.00
Length of head.....	2.89- 3.06
Width of head.....	2.62- 2.71
Diameter of eye.....	0.73- 0.74
Length of pronotum.....	1.09- 1.23
Width of pronotum.....	2.23- 2.36
Length of hind tibia.....	2.71- 2.80
Length of anterior wing.....	21.00-22.00
Width of anterior wing.....	5.50- 5.60
Length of queen.....	75.00
Width of abdomen of queen.....	18.00

T. latialatus has a scarcely perceptible notch in the front margin of the pronotum and the pronotum is wider. *T. buchholzi* is larger. *T. agilis* is larger. The pronotum of *T. salebrifrons* is as wide as the head between the eye points. The ocelli of *T. culturarum* are farther from the eyes. *T. amanicus* has a larger pronotum. A queen of *T. badius* in Sjöstedt's collection, collected and determined by Haviland (Natal, 1894, No. 75), has the following measurements: width of head, 2.94 mm.; length of pronotum, 1.59 mm.; width of pronotum, 2.85 mm.

SOLDIER.—Head reddish yellow; sides slightly rounded, converging toward the front; a few bristles scattered over the head. Antennæ with 17 segments, the third smaller than the second, the fourth equal to the second. Black eye spots behind the bases of the antennæ. Mandibles black except at the base. Anterior and posterior margins of the pronotum emarginate.

Length of head.....	5.25-5.68 mm.
Width of head.....	2.89-3.23
Length of antennæ.....	2.62-2.89
Length of pronotum.....	0.87-1.05
Width of pronotum.....	1.95-2.01
Length of hind tibia.....	2.27-2.45
Length of left mandible.....	1.66-1.92

T. culturarum is smaller. *T. badius* specimens (Natal, 1894, Haviland) have proportionately longer mandibles and shorter head with more converging sides. *T. monodon* has a proportionately wider head. *T. amanicus* close but with more distinct keel on head.

Type Locality.—Region of Stanleyville, Belgian Congo: No. 22T, Kohl Coll.

Other Locality.—Near Lukolela, Belgian Congo: Lang-Chapin Coll., July 17, 1909.

Holotype.—Winged imago (A. M. N. H.).

Morphotype.—Soldier (A. M. N. H.).

Described from many winged imagos and soldiers and one queen (No. 25T) collected together with many workers (Kohl Coll., Nos. 22T, 25T, 27Ta) and several soldiers and workers collected by Lang on the steamer from Lukolela to Basoko in fire-wood. I have named the species in honor of Father H. Schmitz, S.J., of Ignatius College, Valkenburg, Holland.

Termes (Termes) terricola Sjöstedt

Text Figure 20

IMAGO (Queen).—Head yellow brown, a light dot at the base of each hair giving a speckled appearance; oval in shape; covered with fairly long hair; fontanelle a rather inconspicuous dot in the middle of the head. The third segment of the antennæ equal to the fourth, the second larger than the third or fourth. Eyes of medium size, not

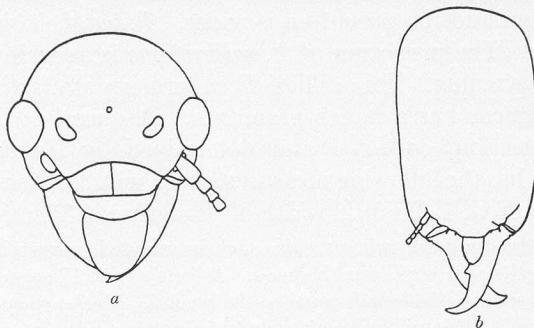


Fig. 20. *Termes (Termes) terricola* Sjöstedt.
a, head of imago from above; b, head of soldier from above.

very close to the lower margin. Ocelli rather large, .267 mm. wide, .33 mm. long, .20 mm. removed from the eyes. Postclypeus not nearly as long as one-half its width, slightly lighter than the head, median line present. Pronotum proportionately wide and short; anterior margin evenly concave; posterior margin nearly straight or weakly concave, but not emarginate; sides nearly straight, strongly converging toward the rear. Pronotum slightly lighter than the head. Posterior margins of the meso- and metanota nearly straight, somewhat concave.

Abdomen of queen with wart-like thickenings on the side. This seems to be a generic character of *Termes*.

Length of head.....	3.00 mm.
Width of head.....	2.67
Diameter of eye.....	0.67
Length of pronotum.....	1.17
Width of pronotum.....	2.50
Length of queen.....	59.00
Width of abdomen of queen.....	10.00

Head proportionately narrower in the female than in *T. schmitzi* and the pronotum conspicuously more angular. *T. agilis* slightly larger but Sjöstedt's description is not sufficient to determine a queen without winged individuals. The description of *T. angustipennis* largely deals with the wing characters. *T. apollo* is larger. The ocelli in *T. aurora* are more than their length from the eyes. *T. terricola* is difficult to distinguish from the description of *T. buchholzi* but the ocelli in *T. buchholtzi* are closer (.11 mm.) to the eyes. The ocelli are more than their length from the eyes in *T. diana*. *T. latialatus* cotype has ocelli closer (.13 mm.) to the eyes.

SOLDIER.—Head reddish yellow, rectangular; sides nearly straight and parallel. The third segment of the antennæ smaller than the fourth, the fourth equal to the second. Eyes represented by black dots behind the antennæ bases. Mandibles proportionately short. Anterior and posterior margins of the pronotum emarginate, the posterior emargination deeper than the anterior.

Length of head.....	5.25 mm.
Width of head.....	2.40
Length of pronotum.....	0.79
Width of pronotum.....	1.66
Length of hind tibia.....	1.84
Length of left mandible.....	1.65

T. anceps has shorter mandibles. *T. badius* has proportionately wider head and longer mandibles. *T. patruus* is smaller. *T. mukim-bunginis* has a proportionately shorter head. *T. monodon* has a shorter and wider head.

Locality.—Region of Stanleyville, Belgian Congo: Kohl Coll., No. 26T.

Described from a single queen and single soldier collected together with several workers. The soldier agrees perfectly with the cotype except that the cotype is a little larger.

Termes (Termes) culturarum (Sjöstedt)

Text Figure 21

IMAGO (Queen).—Head oval, brown; a large lighter spot surrounding the rather inconspicuous fontanelle; head covered with bristles and hairs; back of head with median dark line. The third segment of the antennæ equal to the fourth, the second larger than the third or fourth. Eyes not large, fairly close to the lower margin of the head. Ocelli of medium size, .267 mm. wide, .32 mm. long, .28 mm. removed from the eyes. Postclypeus rather short, lighter than the head, median line present. Pronotum slightly lighter than the head; sides somewhat rounded and strongly converging toward the rear; posterior margin slightly emarginate; angles rounded. Posterior margins of the meso- and metanota rather strongly concave. Sides of abdomen of queen with warty thickenings.

Length of head.....	3.15 mm.
Width of head.....	2.71
Diameter of eye.....	0.67
Length of pronotum.....	1.22
Width of pronotum.....	2.45
Length of hind tibia.....	2.54
Length of queen.....	71.00
Width of abdomen of queen.....	11.00

T. apollo is larger. *T. agilis* is close in so far as Sjöstedt's description goes, but his description is too meagre to make sure of the species. It is

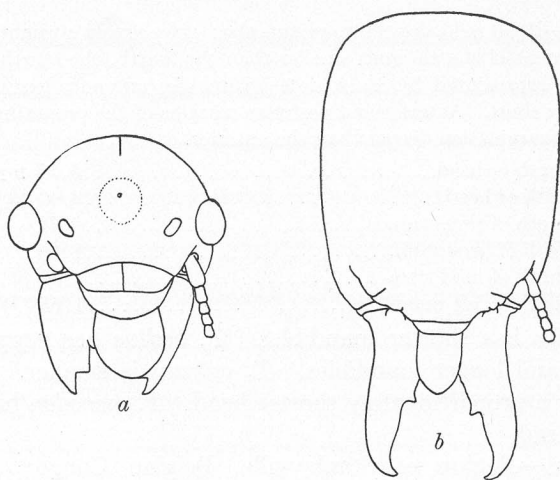


Fig. 21. *Termes (Termes) culturarum* (Sjöstedt).
a, head of imago from above; b, head of soldier from above.

impossible to compare the queen before me with the description of *T. angustipennis* Sjöstedt as his characters lie largely in the wings. *T. bottegoanus* is larger and the postclypeus is the same color as the head. *T. buchholzi* has the ocelli close (.11 mm.) to the eyes. *T. diana* has the ocelli one-fourth more than their length from the eyes. In *T. ebeni* the ocelli are farther than their length from the eyes. *T. latialatus* has smaller eyes. *T. palmquisti* is larger. *T. ramulosus* is fairly close, but no mention is made of the light spot on the head in the description. *T. salebrifrons* is smaller.

SOLDIER.—Head reddish yellow, sparsely covered with hair; sides somewhat rounded, not converging toward the front to much extent. Antennæ with 17 segments, the third shorter than the fourth, the fourth shorter than the second. Eyes represented by black dots behind the antennal bases. Sides of labrum parallel.

Dentation and thickness of the mandibles similar in proportion to *T. mukimbunginis*. Anterior and posterior margins of the pronotum rather deeply emarginate.

Length of head.....	4.81-4.99 mm.
Width of head.....	2.51-2.71
Length of antennæ.....	2.45
Length of pronotum.....	0.87
Width of pronotum.....	1.71-1.84
Length of hind tibia.....	1.88-2.01
Length of left mandible.....	1.75

T. anceps has shorter mandibles. *T. badius* has a proportionately wider head and the sides of the head are not so parallel. *T. monodon* larger with proportionately wider head.

Locality.—St. Gabriel, near Stanleyville, Belgian Congo: Kohl Coll., Oct. 2, 1913.

Described from one queen and four soldiers collected with numerous workers and nymphs.

***Termes (Termes) mukimbunginis* (Sjöstedt)**

Text Figure 22

MAJOR SOLDIER.—Head from light to dark reddish yellow, somewhat narrowed in front; with very few bristles. Antennæ with 17 segments, the third smaller than the

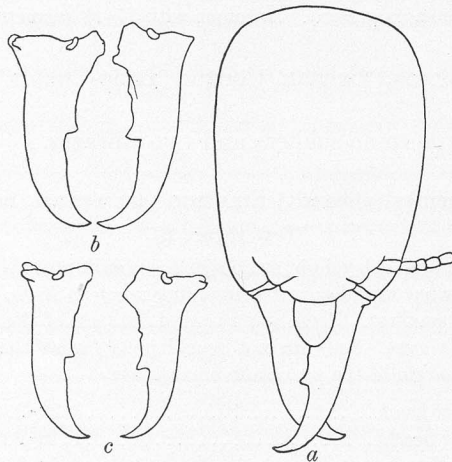


Fig. 22. *Termes (Termes) mukimbunginis* (Sjöstedt).

a, head of major soldier from above; b, mandibles of major soldier; c, mandibles of minor soldier.

fourth, the fourth shorter than the second. Eye spots small, dark and distinct. Labrum extending to or nearly to the tooth of the left mandible when the mandibles are closed. Both front and hind margins of the pronotum emarginate.

Length of head.....	3.60-3.65 mm.
Width of head.....	1.84-2.00
Length of pronotum.....	0.80
Width of pronotum.....	1.30
Length of hind tibia.....	1.60
Length of left mandible.....	1.44-1.50

Smaller than *T. badius*, *T. culturarum* and *T. patruus*. Larger than *T. lobintactus*. Answers the description of *T. trågårdhi* Holmgren, but as Fuller (1922) seems to be doubtful of the validity of this species and as it has only been reported from Natal, it seems best to separate these species. *T. mukimbunginis* has a proportionately narrower head than *T. anceps* Sjöstedt. *T. tanganicus* (Sjöstedt) is the same size as *T. mukimbunginis* but the sides are not rounded. Very close to *T. fallax* but the mandible beyond the tooth is more curved.

MINOR SOLDIER.—Eye spots present.

Length of head.....	3.17-3.40 mm.
Width of head.....	1.60-1.80
Length of pronotum.....	0.67-0.75
Width of pronotum.....	1.14-1.20
Length of hind tibia.....	1.33-1.55
Length of left mandible.....	1.30

WORKER.—Eye spots present. Antennæ with 17-18 segments. Width of head, 1.44 mm.

Locality.—Boma, Belgian Congo: Lang-Chapin Coll., June 18, 1915.

Described from nine soldiers and two workers.

Termes (Termes) sjöstedti Emerson var. **evansi**, new variety

Text Figure 23

SOLDIER.—Head reddish yellow, some specimens dark probably due to preserving. Sides of head somewhat rounded, not converging much in front. Antennæ with 17 segments, the third smallest. Black spots behind the base of the antennæ which are probably degenerate eyes. Labrum not reaching as far as the tooth on the left mandible. Front margin of the pronotum emarginate.

Length of head.....	3.21-3.38 mm.
Width of head.....	1.48-1.61
Length of pronotum.....	0.58-0.64
Width of pronotum.....	1.03-1.09
Length of hind tibia.....	1.28
Length of left mandible.....	1.28

Larger than typical form. The tip of the mandible in *T. pauperans* is more curved.

Type Locality.—Senegambina, Cameroon: Nos. 228, 239, B. C. Z. Evans Coll., April 24, 1920; No. 244, B. C. Z. Evans Coll., April 25, 1920; No. 50, R. N. Evans Coll., April 29, 1920.

Holotype.—Soldier (A. M. N. H.).

The description is based on numerous specimens. I have named the variety in honor of B. C. Z. Evans whose collections of termites are described in this paper.

Termes (Termes) malelaensis, new species

PLATE XXII; Text Figure 24

SOLDIER.—Head reddish yellow, but perceptibly darker in front; slightly narrowed in front; clothed with a few sparsely scattered bristles. Antennæ with 17

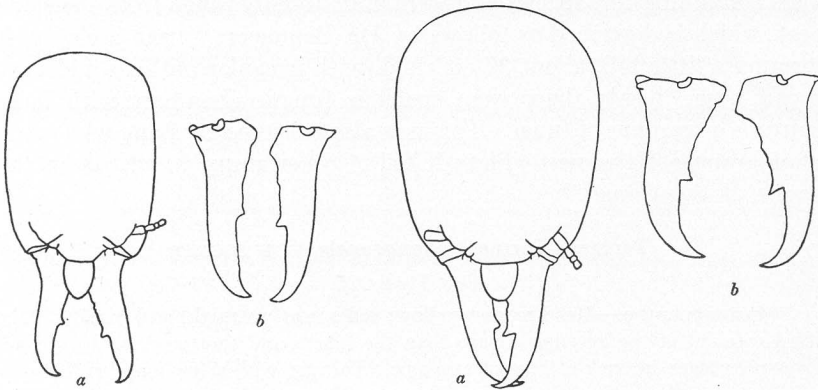


Fig. 23

Fig. 23. *Termes (Termes) sjöstedti* Emerson var. *evansi*, new variety.

a, head of soldier from above; b, mandibles of soldier.

Fig. 24

Fig. 24. *Termes (Termes) malelaensis*, new species.

a, head of soldier from above; b, mandibles of soldier.

segments, the third smallest, the fourth shorter than the second. Eye spots dark. Sides of labrum rounded; point not nearly as sharp as in *T. sjöstedti* var. *evansi*; tip with a number of long bristles. Labrum not extending as far as the tooth of the left mandible when the mandibles are closed. Mandibles dark red-brown, the bases same color as the head. Front margin of the pronotum emarginate.

Length of head.....	3.20 mm.
Width of head.....	1.61–1.70
Length of pronotum.....	0.70
Width of pronotum.....	1.10
Length of hind tibia.....	1.40–1.56
Length of left mandible.....	1.19–1.28

Very close to *T. pauperans* but seems to differ from Silvestri's figure in the shape of the teeth and mandibles; also slightly larger. *T. ostentans* also seems to be close but differs in the dentation of the mandibles in Silvestri's figure. Close to *T. sudanensis* but seems to be more narrow in front. *T. badius* is much larger.

WORKER.—Antennæ with 17 segments. Width of head, 1.45 mm.

Type Locality.—Malela, Belgian Congo: Lang-Chapin Coll., No. 961, July 4, 1915.

Holotype.—Soldier (A. M. N. H.).

Described from numerous soldiers and workers collected by Lang and from the same nest by Dr. Bequaert (No. 237).

Many specimens of *Acanthotermes militaris* were also found in the vials containing this species and were undoubtedly taken from the same nest, which is described as follows by Dr. Bequaert: "from a clay nest forming a little hill, about 30 cm. high with irregular outlines and very broad base; inside there were spacious fungus chambers with large cultures or gardens of fungi. This was also collected by Lang who made photographs of the nest (Plate XXII). In swampy woods along the banks of the Congo."

***Termes (Termes) akengeensis*, new species**

Text Figure 25

MAJOR SOLDIER.—Head reddish yellow; sides nearly straight and parallel. The third segment of the antennæ longer than the fourth and shorter than the second. Eye spots black in back of base of antennæ. Labrum with a few long bristles; extending out to the tooth of the left mandible when the mandibles are closed. Mandibles dark red-brown, lighter at the base. Front margin of the pronotum conspicuously emarginate.

Length of head.....	3.20-3.21 mm.
Width of head.....	1.51
Length of pronotum.....	0.58-0.61
Width of pronotum.....	0.96
Length of hind tibia.....	1.19
Length of left mandible.....	1.12

Very close to *T. pauperans* Silvestri but seems to differ from the description and figure in more parallel sides, head not quite as much narrowed in front and labrum reaching to the tooth of the left mandible. Silvestri examined specimens of this species and writes that he believes it to be only a variety of *T. stercorivorus*. The sides of the head of *T. stercorivorus* are more curved, however. The cotype soldiers of *T. tan-ganicus* are conspicuously larger, but one soldier in a vial with cotypes in

Silvestri's collection is close if not identical with *T. akengeensis*. I believe there must have been an error in including these specimens in the same vial.

MINOR SOLDIER.—The minor soldier may be merely a variation of the major soldier and not a true caste.

Length of head.....	2.90 mm.
Width of head.....	1.28
Width of pronotum.....	0.87
Length of hind tibia.....	1.12
Length of left mandible.....	0.96

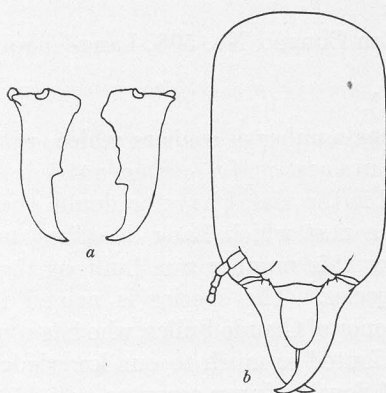


Fig. 25

Fig. 25. *Termes (Termes) akengeensis*, new species.

a, mandibles of soldier; *b*, head of soldier from above.

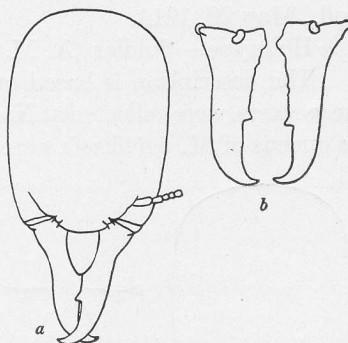


Fig. 26

Fig. 26. *Termes (Termes) fulleri*, new species.

a, head of soldier from above; *b*, mandibles of soldier.

Type Locality.—Akenge, Belgian Congo: Lang-Chapin Coll., Oct., 1913.

Holotype.—Soldier (A. M. N. H.).

The description is based on four major soldiers and one minor soldier taken from the stomach contents of *Arthroleptus variabilis*. Workers were also present in the stomach contents.

***Termes (Termes) fulleri*, new species**

Text Figure 26

SOLDIER.—Head reddish yellow; sides straight and parallel, not converging toward the front. Antennæ with 15–16 segments; usually 16, in which case the fourth is slightly shorter than the third and the third is shorter than the second. Eye spots not visible or very inconspicuous behind the base of the antennæ. Labrum

not reaching as far as the tooth of the left mandible when the mandibles are closed. Front margin of the pronotum deeply emarginate.

Length of head.....	2.73-2.79 mm.
Width of head.....	1.28-1.35
Length of pronotum.....	0.48-0.51
Width of pronotum.....	0.93-0.96
Length of tibia.....	0.96
Length of left mandibles.....	1.12

T. stercorivorus has a proportionately longer head. *T. scrutator* has less prominent mandibular teeth and the mandible is less curved at the tip. *T. badius* is much larger.

Type Locality.—Niagara, Belgian Congo: No. 598, Lang-Chapin Coll., May 20, 1913.

Holotype.—Soldier (A. M. N. H.).

The description is based on a large number of soldiers which, with the workers, were collected at Niagara in a nest of *Macrotermes natalensis*. As queens of *M. natalensis* were found in the vial, I have no doubt that

the nest which Lang describes under this number was built by that species. The species is named in honor of Claude Fuller, who has contributed so much to our knowledge of South African termites.

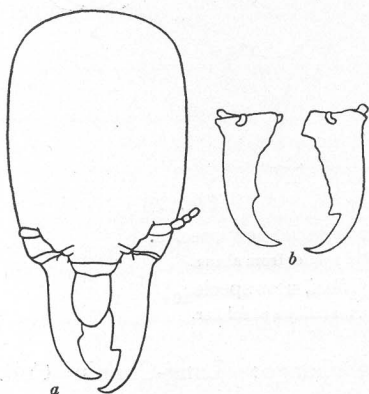


Fig. 27. *Termes (Termes) snyderi*, new species.

a, head of soldier from above; b, mandibles of soldier.

***Termes (Termes) snyderi*,**
new species

Text Figure 27

SOLDIER.—Head reddish yellow, sparsely clothed with bristles; sides somewhat rounded and nearly parallel; head not as narrowed in front as *T. malelaensis*. Antennae with 17 segments, the third smaller than the fourth, the fourth slightly shorter than the second. Labrum not extending as far as the tooth on the left mandible when

the mandibles are closed, outer half with long bristles. Mandibles dark red-brown, base reddish yellow. Front margin of the pronotum emarginate.

Length of head.....	2.90-3.00 mm.
Width of head.....	1.45-1.51
Length of pronotum.....	0.67
Width of pronotum.....	1.20
Length of hind tibia.....	1.28-1.35
Length of left mandible.....	0.97-1.03

Larger than *T. fulleri* and the mandibles with different dentation. *T. interveniens* and *T. vulgaris* have the same measurements, but the dentation is different.

Type Locality.—Leopoldville, Belgian Congo: Lang-Chapin Coll., July 11, 1909.

Holotype.—Soldier (A. M. N. H.).



Map 11. Distribution of the genus *Ancistrotermes*.

The description is based on nine soldiers which, together with four workers, were collected at the type locality. A label written by Chapin found in the vial states that the specimens were "found under an old piece of matting on the ground."

The dentation of the mandibles approaches the subgenus *Cyclotermes* but hardly enough to warrant placing the species in this group.

I have named this species in honor of Dr. T. E. Snyder of the U. S. Bureau of Entomology, whose studies on termites are rapidly advancing the knowledge of this group.

ANCISTROTERMES Silvestri

The known distribution of this genus is rather meagre (Map 11); it seems to be confined largely to the savannah and grass-lands. Since the completion of Map 11, Sjöstedt (1926) has reported *A. crucifer* from Dakar, Senegal. Also *A. latinotus* is known from Libenge, Belgian Congo and *A. periphrasis* is known from El Amira and Khor El Affin, Sudan. The distinction in the size of the ocelli which Fuller (1922) regards as a main character between *A. lebomboensis* and the other species of the genus I believe to be a mistake. Silvestri gave measurements of the compound eye which Fuller seems to have translated as measurements of the ocelli. His species is probably distinct from the more northern forms, but needs further description. I believe that var. *guineensis* of Silvestri's deserves specific rank also.

The species of this genus seem to have two soldier castes which differ mainly in size. The species are usually found in the large nests of *Macrotermes* and *Termes*.

Ancistrotermes crucifer (Sjöstedt)

Text Figure 28

MAJOR SOLDIER.—Bristles scattered thinly over the head. Antennæ with 14-15 segments; third a little longer than the second and the fourth a little shorter than the second in the antennæ with 14 segments; third shorter than the fourth, fourth shorter than the second in the antennæ with 15 segments. Mandibles strongly curved at the tip. Front margin of the pronotum deeply cut, not as deeply cut, however, as in Silvestri's figure of var. *guineensis*.

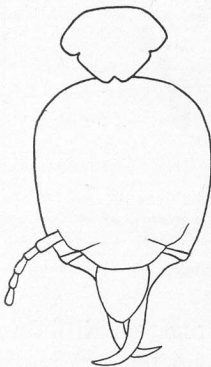


Fig. 28. *Ancistrotermes crucifer* (Sjöstedt).
Head and pronotum of soldier from above.

Length of head.....	1.89 mm.
Width of head.....	1.10-1.20
Length of pronotum in the middle.....	0.50
Length of entire pronotum.....	0.60
Width of pronotum.....	0.72-0.78
Length of hind tibia.....	0.97-1.05
Length of left mandible.....	0.80

Differs from *A. latinotus* in the somewhat smaller size. *A. guineensis* cotypes are larger, the sides of the head are straighter, the tips of the mandibles are more curved and the pronotum is more deeply cut.

MINOR SOLDIER.—Antennæ with 14 segments.

Length of head.....	1.44 mm.
Width of head.....	0.78
Length of pronotum in the middle.....	0.33

Width of pronotum.....0.58 mm.

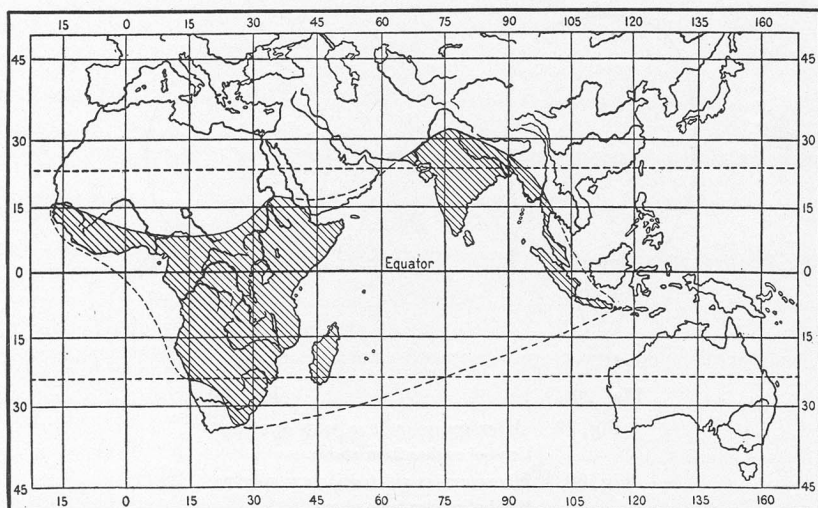
Length of hind tibia.....0.83

Length of left mandible.....0.67

WORKER.—Antennæ with 15 segments.

Localities.—Niangara, Belgian Congo: No. 597, Lang-Chapin Coll., May 20, 1911. Yakuluku, Belgian Congo: No. 302, Lang-Chapin Coll., Dec., 1911.

Described from several soldiers from these localities. The specimens from Niangara were found in a nest of *Macrotermes natalensis* and the specimens from Yakuluku were taken from a mushroom-shaped nest of *Mirotermes (Cubitermes) orthognathus*.



Map 12. Distribution of the genus *Microtermes*.

MICROTERMES Wasmann

This genus is usually found associated with *Macrotermes* and *Termes* and has been referred to as parasitic by some authorities. That it can exist by itself outside the nests of these larger termites is well attested. It is even represented in Madagascar where no positive record of either *Macrotermes* or *Termes* has been obtained. It is the only fungus growing termite recorded from Madagascar to my knowledge. However, Hegg (1922, p. 290) published a figure of a large termitarium filled with fungus gardens taken from Jumelle and Perrier. This nest seems to be too large to be built by a *Microtermes*. The species is referred to as *Termes Perrieri* Desneux, the description of which I have never seen.

The genus is spread over the Ethiopian, Malagasy, and most of the Indomalayan region (Map 12). I have been able to divide the specimens contained in the collections before me into five species. Three species are described as new.

***Microtermes calvus*, new species**

Text Figure 29

SOLDIER.—Head oval, yellow; hairs and bristles practically absent, only one or two present on the top of the head. Gula very wide. Antennæ with 15 segments, the third equal to the fourth and smaller than the second. Inner edge of the left mandible somewhat serrated. Inner edge of the right mandible with two minute teeth, one

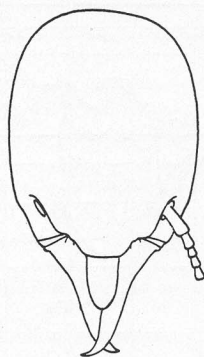


Fig. 29

Fig. 29. *Microtermes calvus*, new species.

Head of soldier from above.

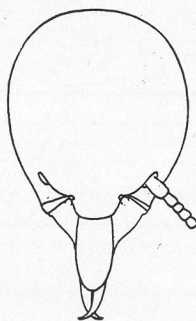


Fig. 30

Fig. 30. *Microtermes sjöstedti*, new species.

Head of soldier from above.

anterior to the middle and the other close to the basal knob. Pronotum lighter than the head; anterior and posterior margins emarginate; clothed with numerous bristles. Abdominal tergites with numerous bristles.

Length of head.....	2.07 mm.
Width of head.....	1.10
Length of antennæ.....	1.57
Length of pronotum.....	0.50
Width of pronotum.....	0.87
Length of hind tibia.....	0.95
Length of left mandible.....	0.73

Differs from all the species before me in the lack of hairs and bristles on the head, in the large size, and in the dentation of the mandibles

Type Locality.—St. Gabriel near Stanleyville, Belgian Congo: No. 15T, Kohl Coll., Nov. 30, 1909.

Holotype.—Soldier (A. M. N. H.).

Described from two soldiers and several workers.

Father Kohl includes the following observations in his field notes, which have been translated from the German. "I found this variety of termite in the ground, at a depth of 1 meter 30 centimeters. The fungus chambers appear to be situated wide apart; the entrance holes to these are small, doubtless in correspondence with the size of the variety. I did not discover the actual habitation spaces. The fungus gardens are in my collection."

***Microtermes sjöstedti*, new species**

Text Figure 30

SOLDIER.—Head widely oval, yellow; thickly covered with rather long hair. Antennæ with 15 segments, the third smaller than the fourth, the fourth smaller than the second. Labrum rather long, reaching over half the length of the mandibles. Mandibles slender, curved at the tip. Inner edge of the left mandible smooth. Inner edge of the right mandible with slight indication of two teeth, one beyond the middle and the other near the basal knob. Anterior margin of the pronotum emarginate, posterior margin somewhat emarginate.

Length of head.....	1.63 mm.
Width of head.....	0.97
Length of antennæ.....	1.33
Length of pronotum in the middle.....	0.43
Length of entire pronotum.....	0.50
Width of pronotum.....	0.73
Length of hind tibia.....	0.93
Length of left mandible.....	0.73

Type Locality.—Region of Stanleyville, Belgian Congo: No. 28T, Kohl Coll.

Holotype.—Soldier (A. M. N. H.).

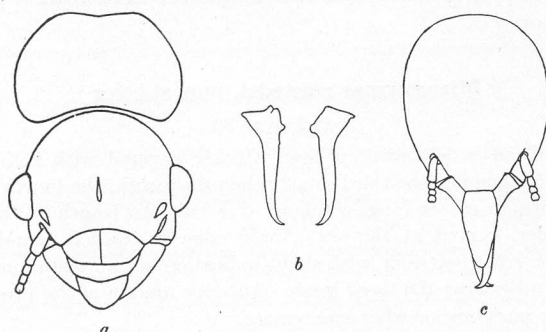
Described from numerous soldiers which were taken together with workers. A translation of Father Kohl's field notes follows. "Termites found in a fungus garden in a mushroom-shaped nest (*Cubitermes*) which was abandoned by the actual builders of the nest. The garden is in my collection."

I have named the species in honor of Prof. Y. Sjöstedt, who has laid the foundation for all recent and future study of Ethiopian termites.

Microtermes osborni, new species

Text Figure 31

IMAGO.—Head brown, each hair making a small light dot; oval; fontanelle about the same color as the head, inconspicuous, elongate. Antennæ with 15 segments, the third equal to the fourth, the second slightly longer. Eyes of medium size, fairly close to the lower margin of the head. In the specimens before me, the eyes are not heavily pigmented which may be due to their preservation. Ocelli of medium size, facing toward the side; less than their width from the eyes. Postclypeus rather long, lighter than the head; median line present. Pronotum lighter than the head, a light Y-shaped series of marks in the middle; anterior margin somewhat emarginate; sides

Fig. 31. *Microtermes osborni*, new species.

a, head and pronotum of imago from above; b, mandibles of soldier; c, head of soldier from above.

rounded; posterior margin slightly emarginate. Posterior margins of the meso- and metanota widely emarginate. Wings hyaline. Abdominal tergites slightly lighter than the pronotum.

Length with wings.....	14.00 mm.
Length without wings.....	8.00
Length of head.....	1.47
Width of head.....	1.27
Length of antennæ.....	2.00
Diameter of eye.....	0.38
Length of pronotum.....	0.66
Width of pronotum.....	1.20
Length of hind tibia.....	1.33
Length of anterior wing.....	12.00
Width of anterior wing.....	3.10
Length of queen.....	29.00
Width of abdomen of queen.....	4.50

Microtermes magnocellus has larger ocelli only one-sixth of their diameter from the eyes. *M. lounsburyi* is smaller but seems to be a

closely related species. *M. vadschaggæ* has smaller ocelli. *M. thoracalis* has smaller ocelli and the sides of the pronotum are straighter in back.

SOLDIER.—Head yellowish, thickly covered with short hair; sides rounded and converging toward the front. Antennæ with 13 segments, the third smaller than the fourth, the fourth smaller than the second. Labrum long, reaching well over half the length of the mandibles. Mandibles dark red brown, base yellow. Anterior margin of the pronotum deeply emarginate. Tibiæ of front legs enlarged.

Length of head.....	1.22–1.27 mm.
Width of head.....	0.64–0.73
Length of antennæ.....	1.05
Length of pronotum.....	0.33
Width of pronotum.....	0.47–0.50
Length of hind tibia.....	0.58
Length of left mandible.....	0.56

M. subhyalinus var. *depauperata* has twelve segments in the antennæ; otherwise it is fairly close. *M. subhyalinus* has a proportionately shorter head. *M. pusillus* has twelve segments in the antennæ. *M. albopartitus* has a shorter labrum. Very close to the description of the soldier of *M. vadschaggæ*, but the measurements are smaller. The mandibles of *M. trågårdhi* are very finely serrate. Seems to answer the description of *M. lounsburyi* so far as it goes.

Type Locality.—St. Gabriel near Stanleyville, Belgian Congo: Kohl Coll. (No number).

Holotype.—Soldier (A. M. N. H.).

Morphotype.—Winged imago (A. M. N. H.).

Other Localities.—St. Gabriel near Stanleyville, Belgian Congo: Nos. 3, 19T, 20aT, 83 unter, II, Kohl Coll. Niangara, Belgian Congo: No. 607, Lang-Chapin Coll., June 10, 1915.

Described from several winged imagos, two kings, two queens and many soldiers from the type locality and several soldiers from Niangara. Winged imagos contained in the same vial with the Niagara specimens did not belong to *Microtermes*.

The species is named in honor of President Henry Fairfield Osborn of The American Museum of Natural History.

Father Kohl made the following observations which are translated from his field notes. "I found these engaged in their mating flight at 6 P.M. They came out of the ground. (No. 19T, St. Gabriel, May 8, 1910)."

Microtermes feæ SilvestriText Figure 32*b* and *c*

MAJOR SOLDIER.—Head yellow; rectangular, proportionately rather long; sides slightly rounded; fairly thickly covered with hair. Antennæ with 12 segments, the third showing slight signs of dividing, the second, third and fourth about equal. Labrum with a slight constriction about one-half its length from the base, extending about one-half the length of the mandibles. Mandibles typical, without teeth. Fontanelle inconspicuous. Front margin of the pronotum conspicuously emarginate.

Length of head.....	1.67 mm.
Width of head.....	0.78
Length of pronotum.....	0.37
Width of pronotum.....	0.52
Length of hind tibia.....	0.58
Length of left mandible.....	0.63

The labrum of *M. congoensis* var. *comprehensa* is proportionately longer and the head proportionately shorter. *M. alluaudanus* is a little smaller but is otherwise very close. *M. kasaiensis* is smaller. I am unable to find a character to separate this species from the description of *M. congoensis*. Silvestri, however, has examined specimens from Thysville and believes them to be *M. feæ*. I am therefore referring this species to *M. feæ*, although Silvestri's measurements are slightly smaller and the sides of the head seem to be straighter than indicated in

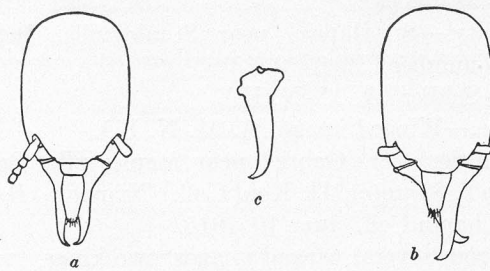


Fig. 32. *a*, *Microtermes pusillus* (Silvestri), head of soldier from above; *b*, *Microtermes feæ* Silvestri, head of soldier from above; *c*, *Microtermes feæ* Silvestri, mandible of soldier.

Silvestri's figure. Silvestri (1914) states that the mandibles are more robust in *M. feæ* than in *M. congoensis*.

MINOR SOLDIER.—Antennæ with 12 segments. Labrum reaching more than half the length of the mandibles.

Length of head.....	1.22 mm.
Width of head.....	0.62
Length of hind tibia.....	0.44

WORKER.—Width of head, 0.67 mm.

Localities.—Thysville, Belgian Congo: No. 186, J. Bequaert Coll., June 4, 1915. Bipindi, Cameroon: G. Zenker Coll., No. 36, 1920.

Described from eight major soldiers and two workers from Thysville; and two major soldiers and two minor soldiers from Bipindi.

Dr. Bequaert records the following data on the Thysville specimens: "from galleries in decaying wood, in a narrow gallery of forest in the grass country." Specimens of *Sphærotermes sphærothorax* were also found in this vial.

***Microtermes pusillus*. (Silvestri)**

Text Figure 32a

SOLDIER.—Head yellow; oval rectangular; sides somewhat rounded; covered rather thickly with fairly long hair. Antennæ with 12 segments, the third equal to the fourth, the second longer. Labrum reaching over half the length of the mandibles. Fontanelle inconspicuous. Front margin of the pronotum conspicuously emarginate.

Length of head.....	1.27-1.29 mm.
Width of head.....	0.63-0.67
Length of pronotum.....	0.28
Width of pronotum.....	0.42
Length of hind tibia.....	0.51
Length of left mandible.....	0.50

M. alluaudanus is close but the head with the mandibles is 1.50 mm. long, while the width of the head is only .65 mm. *M. congoensis* var. *comprehensa* has a proportionately wider head. The soldiers of *M. dubius* described by Fuller must be close to this species. The head of *M. kasaiensis* is longer.

WORKER.—Antennæ with 12 segments, the third showing signs of dividing.

Width of head.....	0.72-0.78 mm.
Length of hind tibia.....	0.44

Locality.—Thysville, Belgian Congo: No. 187, Bequaert Coll., June 3, 1915.

Described from six soldiers and numerous workers from the above locality.

The following data is taken from Dr. Bequaert's field notes: "nest in wood and extending in the soil below, in dry, rocky, open savannah country."

Two soldiers in this vial bore a fungus parasite, in one case on the head and in the other on the leg. I sent the specimens to Prof. Roland Thaxter who determined them as a species of *Termitaria*. He writes as follows: "The species does not appear to be the same as the American and European forms, and is without doubt new. But, with so small an

amount of material, I should not be willing to describe it. It is very near *Termitaria snyderi*, but differs in color, and in the character of the margin."

NASUTITERMES Banks

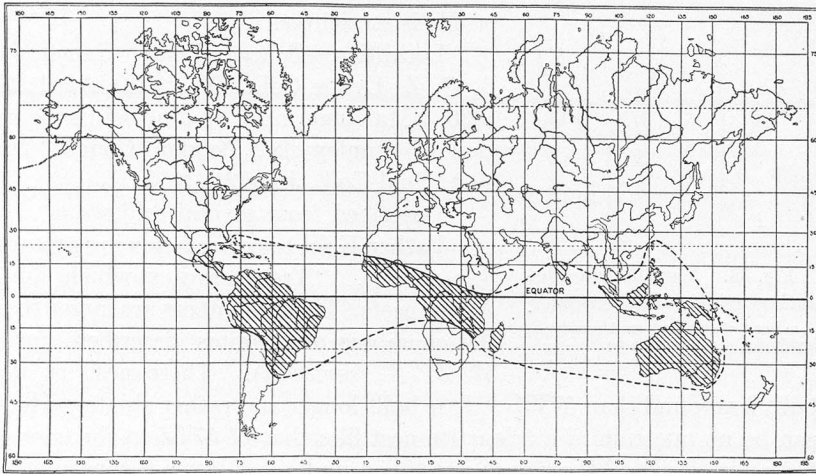
I am using this name to include all the species with nasute soldiers with functionless degenerate mandibles. Recently a number of authors have raised some of Holmgren's subgenera to generic rank while others fail to distinguish between the subgenera but treat the genus as undivided. As no one has attempted to revise the group as a whole since Holmgren (1912), I am retaining the subgeneric distinctions given by him although recent advances in the knowledge of these forms may justify the raising of many of these subgenera to generic rank.

There is great confusion concerning the name of this genus. Most authors have been confining the name *Eutermes* to this group. Banks, (Banks and Snyder, 1920) however, has pointed out that the type species, *Eutermes debilis* Heer, does not belong here and asserts that Hagen had compared the type with a living species from the West Indies and found them to be the same. As this West Indian species belonged to *Microcerotermes*, Banks has discarded that name and substituted the name *Eutermes* for it. This has caused great confusion, as some termitologists have not adopted the change and some have. If we were sure that Hagen's comparison was correct, I should not hesitate to adopt this change, but the type species is known only from the imago preserved in gum copal and Hagen had no idea of the generic characters now used to separate the imagos. It is also well known how very difficult it is to determine the genus of the imago without the help of soldier characters. Banks, himself, has constantly confused species of *Leucotermes* and *Microcerotermes* in the collections deposited in the American Museum and the National Museum. I feel that it is best to confine the generic name *Eutermes* to *Eutermes debilis* Heer until the correct identity of this species is established through careful examination of the type. I am, therefore, using the name *Nasutitermes* proposed by Banks and at the same time retaining the name *Microcerotermes*.

Subgenus **NASUTITERMES** Banks

The typical subgenus is tropicopolitan in its distribution (Map 13) and seems to reach its maximum development in the Neotropical region, where one can safely say it is the dominant group of the rain-forest region. The following localities extend the range of the subgenus beyond

that shown in the map: Yambung, Assam: Moulmein, Lower Burma: Bougainville, Solomon Islands; Ambrym, New Hebrides; Taveuni, Fiji Islands. It builds the large globular nests far up in the trees which have been noticed so often by travellers (Plate XX) and in most cases these nests are built of woody carton without the admixture of dirt or sand (Plate XXVII). The walls grow thicker near the center where the royal cell is usually located and here are often found large numbers of peculiar termitophiles.



Map 13. Distribution of the subgenus *Nasutitermes*, s.str.

Eight species were found in the collections before me and of these I am describing four as new. This brings the total number of species known from the Ethiopian region to twenty-seven as compared with seventy-three recorded from the Neotropical region.

***Nasutitermes* (*Nasutitermes*) *diabolus* (Sjöstedt)**

Text Figure 33

SOLDIER.—Head dark red-brown, nose not lighter than the vertex or region around the base of the antennæ, but slightly lighter than the base of the nose. Line from the tip of the nose to the vertex slightly concave. Antennæ with 13 segments, the third longer than the second, the second longer than the fourth. Mandibles with distinct points. Nose of medium size and rather thick. Front margin of the pronotum very slightly emarginate.

Length of head.....	1.67-1.78 mm.
Width of head.....	0.95-0.97
Length of antennæ.....	1.55
Length of pronotum.....	0.17
Width of pronotum.....	0.47-0.48
Length of hind tibia.....	1.10-1.13

Cotypes have a slightly wider head (.97-1.00 mm.) but are otherwise very close. The shape of the head of *N. diabolus* is different from Wassmann's cotypes of *N. nigrita*. *N. æthiops* cotype has the nose thicker at base and the profile is straighter.

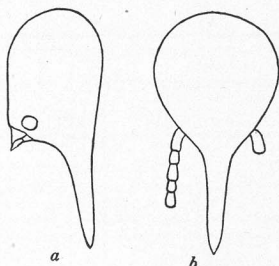


Fig. 33. *Nasutitermes* (*Nasutitermes*) *diabolus* (Sjöstedt).
a, head of soldier from the side; b, head of soldier from above.

Localities.—Senegambina, Cameroon: B. C. Z. Evans Coll., No. 273, April 27, 1920. Makanga, near St. Gabriel in the region of Stanleyville, Belgian Congo: No. 36R, Kohl Coll., June 21, 1913.

Described from several soldiers.

Father Kohl took the following notes on this species. "Tree termites which build carton nests. Their chambers are larger than the chambers of termites described under 57TZ (*N. santschii*). Their nest is also built less round than 57TZ. It is built longer and rather oblate. There can be no question of a tripartite nest like that of 57TZ in the case of these termites: all there is to note is an undivided interior construction with a thin, fragile, exterior shell like that of 57TZ. I found no queen in this nest."

***Nasutitermes* (*Nasutitermes*) *incurvus* (Sjöstedt)**

Text Figure 34

IMAGO.—Head brownish black; widely oval; covered with short hairs and long bristles. Fontanelle inconspicuous, light colored, smaller than the ocelli, forked. Antennæ with 15-16 segments. Eyes large, circular, prominent. Ocelli large, oval; .195 mm. long and .74 mm. from the eyes. Postclypeus without conspicuous median line, very short, a little lighter than the head. Pronotum nearly as dark as the head; sides fairly straight and converging toward the rear; posterior margin emarginate. Posterior margins of the meso- and metanota widely concave. Wings dark smoky.

Length with wings.....	14.00-15.00 mm.
Length without wings.....	7.70- 8.50
Length of head.....	1.53- 1.73
Width of head.....	1.55- 1.70
Length of antennæ.....	2.55

Diameter of eye.....	0.50- 0.53 mm.
Length of pronotum.....	0.72- 0.83
Width of pronotum.....	1.33- 1.43
Length of hind tibia.....	2.00- 2.07
Length of left mandible.....	0.67
Length of anterior wing.....	11.50-12.50
Width of anterior wing.....	3.50- 3.64
Length of queen.....	21.00
Width of abdomen of queen.....	4.30

The posttelypeus of *N. chrysopleura* is light yellow. The type imago of *N. latifrons* has a narrower head, head between ocelli convex and less prominent eyes.

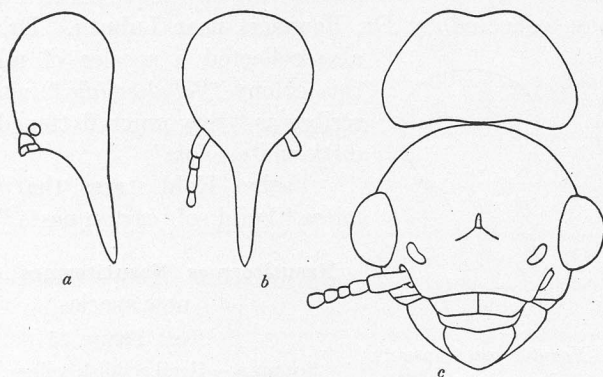


Fig. 34. *Nasutitermes (Nasutitermes) incurvus* (Sjöstedt).

a, head of soldier from the side; *b*, head of soldier from above; *c*, head and pronotum of imago from above.

SOLDIER.—Head light reddish yellow, nose slightly darker. Head fairly wide, line from nose to vertex evenly concave with no elevation at the base of the nose. No bristles or hairs on the head. Antennæ with 13 segments, the third longer than the fourth, the fourth about the same size as the second or slightly longer. Mandible with sharp elongated point. Nose rather slender and fairly long. Anterior margin of the pronotum perfectly rounded with no indication of a notch. Abdominal tergites covered with microscopical hair, but with no marginal bristles except on the posterior tergites.

Length of head.....	1.67-2.07 mm.
Width of head.....	0.86-1.33
Length of antennæ.....	1.67-2.00
Length of pronotum.....	0.20-0.25
Width of pronotum.....	0.44-0.60
Length of hind tibia.....	1.16-1.43

Soldiers vary considerably in size within the same nest.

Close to *N. santschii* but is larger and the profile is concave.

Localities.—Region of Stanleyville, Belgian Congo: Nos. 20cT, 35TZ and 65 TZ unter, Kohl Coll. Avakubi, Belgian Congo: No. 21, Lang-Chapin Coll., Nov. 11, 1909. Lubutu, Belgian Congo: No. 166, Bequaert Coll., Jan. 25, 1915. Near Lukolela, Belgian Congo: Lang-Chapin Coll., July 17, 1909. Malela, Belgian Congo: No. 959, Lang-Chapin Coll., July 6, 1915. Bipindi, Cameroon: Nos. 64, 73G, Zenker Coll., 1920. Senegambina, Cameroon: Nos. 183, 307, 312, B. C. Z. Evans Coll., April, 1920.

The descriptions are based on numerous winged imagos, queens and soldiers.

I found several workers infected with the fungus parasite *Termitaria* among those collected by Dr. Bequaert near Lubutu. Dr. Bequaert also collected a species of millipede in this colony (*Polydesmidæ*?) which he describes as "very much flattened and of a dirty white color."

Father Kohl states that these termites "build soft carton nests."

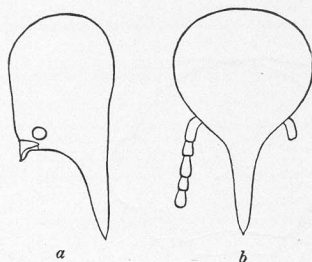


Fig. 35. *Nasutitermes* (*Nasutitermes*) *chapini*, new species.

a, head of soldier from the side; b, head of soldier from above.

***Nasutitermes* (*Nasutitermes*) *chapini*,
new species**

Text Figure 35

SOLDIER.—Head reddish yellow, nose somewhat darker. Line from tip of nose to the vertex not evenly concave but with a slight elevation at the base of the nose. Antennæ with 13 segments, the third longer than the second, the second about equal to the fourth or very slightly longer. Mandibles with distinct points. Nose proportionately rather short. Anterior margin of the pronotum with a distinct but not deep emargination.

Length of head.....	1.67 mm.
Width of head.....	1.07-1.10
Length of antennæ.....	1.60
Length of pronotum.....	0.22
Width of pronotum.....	0.50
Length of hind tibia.....	1.22

The specimens agree with soldiers collected and determined by Sjöstedt as *Eutermes arborum* (Smeathman) from Kamerun, 1891. They differ, however, from soldiers from Aburi, Gold Coast, determined by Silvestri as *E. arborum*. The type locality of *Nasutitermes arborum* is Sierra Leone and the species needs to be rediscovered from the type locality before its identity is established. Very close to *N. incurvus* but

the pronotum is somewhat emarginate and the line from the tip of the nose to the vertex is not evenly concave. *N. torquatus* is close but is smaller and the segments of the antennæ differ. *N. infuscatus* var. *perfusca* has a straighter profile and a longer head. *N. salebrithorax* is larger. The pronotum of *N. schoutedeni* and *N. putidus* is not emarginate.

Type Locality.—Ngayu, Belgian Congo: No. 48, Lang-Chapin Coll., Dec. 22, 1909.

Holotype.—Soldier (A. M. N. H.).

Described from many soldiers taken together with many workers. The species is named in honor of James P. Chapin who coöperated with Herbert Lang in collecting many termites described in this report.

***Nasutitermes (Nasutitermes) torquatus* (Sjöstedt)**

Text Figure 36

IMAGO.—Head dark brown; oval; covered with short hair and long bristles. Fontanelle inconspicuous in the male and an elongated white slit in the female. The third segment of the antennæ smaller than the fourth, the fourth smaller than the

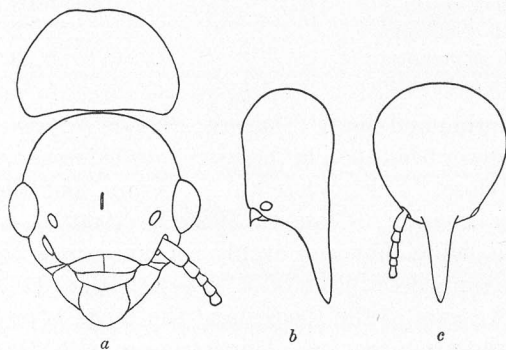


Fig. 36. *Nasutitermes (Nasutitermes) torquatus* (Sjöstedt).

a, head and pronotum of imago from above; b, head of soldier from the side, c, head of soldier from above.

second. Eyes of medium size, fairly close to the lower margin. Ocelli rather small, nearly their length from the eyes. Labrum same color as the postclypeus. Postclypeus a little lighter than the head, median line rather faint. Pronotum a little lighter than the head; sides rounded; posterior margin somewhat emarginate. Posterior margins of meso- and metanota emarginate; angles rounded but sharper in mesonotum. Abdominal tergites same color as the pronotum.

Length of head.....	1.53 mm.
Width of head.....	1.40
Diameter of eye.....	0.43-0.47
Length of pronotum.....	0.67
Width of pronotum.....	1.13-1.20
Length of hind tibia.....	1.67
Length of queen.....	18.50
Width of abdomen of queen.....	6.00

N. arborum is described by Sjöstedt (1900) as having the ocelli close to the eyes. *N. infuscatus* cotypes have a rather conspicuous, wide, forked fontanelle instead of slit-shaped as in *N. torquatus*. *N. santschii* has a narrower pronotum.

SOLDIER.—Head yellowish; profile rather straight with a slight elevation at the base of the nose. Two bristles on the vertex and a few at the base of the nose. Antennæ with 13 segments, the fourth shorter than the second, the second shorter than the third. Nose darker than the head, of medium length and thickness. Anterior margin of the pronotum evenly curved or with a very slight emargination. Abdominal tergites covered with short hair and long marginal bristles. The marginal bristles are short on the anterior tergites and grow longer on the posterior tergites.

Length of head.....	1.57 mm.
Width of head.....	0.93
Length of antennæ.....	1.73
Width of pronotum.....	0.53
Length of hind tibia.....	1.13

The description and figure (Sjöstedt, 1926) of *N. torquatus* indicate a longer and narrower head than in the specimens before me, but otherwise they are very close. Fairly close to *N. chapini* but the head is not proportionately as wide. Close to Sjöstedt (1900) description of *N. arborum* but his figure shows an evenly concave profile of the soldier. Close to Wasmann's description of *N. comorensis* but the description is too meagre to be sure of the species and the range is probably too far distant to be the same species. Agrees closely with Sjöstedt's (1904) description of *N. infuscatus* but the cotypes of that species have a proportionately rounder, wider head. Sjöstedt states that the soldier is similar in all details with *N. arborum*. *N. infuscatus* var. *perfusca* is larger but is otherwise close.

Locality.—Region of Stanleyville, Belgian Congo: Nos. 82TZ, 81TZ unter, 78TZ, 77TZ, 55TZ above, Kohl Coll.

Under the number 81TZ unter, Father Kohl makes the following entry. "These termites build nests of carton. The nest of these specimens was of the size of a child's head. The queen's chamber is in my collection. Magulumane, July 24, 1913."

Nasutitermes (Nasutitermes) fulleri, new species

Text Figure 37

SOLDIER.—Head reddish yellow; oval; profile nearly straight with a slight elevation at the base of the nose. Two bristles on the vertex, few or none at the base of the nose. Antennæ with 12 segments, the third longer than the fourth, the fourth longer or about equal to the second. Mandible with a distinct point. Nose darker than the head, of medium length and thickness. Anterior margin of the pronotum slightly emarginate. Abdominal tergites covered with very minute hair and with a few short bristles, particularly near the posterior end of the abdomen.

Length of head.....	1.50 mm.
Width of head.....	0.85
Length of antennæ.....	1.53
Width of pronotum.....	0.47
Length of hind tibia.....	0.93

Close to Sjöstedt's (1900) description of *N. arborum* but his figure shows a decidedly concave profile of the soldier.

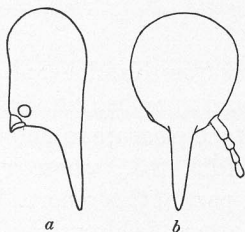


Fig. 37

Fig. 37. *Nasutitermes (Nasutitermes) fulleri*, new species.
a, head of soldier from the side; b, head of soldier from above.

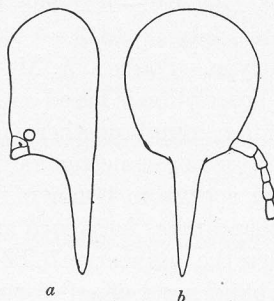


Fig. 38

Fig. 38. *Nasutitermes (Nasutitermes) kohli*, new species.
a, head of soldier from the side; b, head of soldier from above.

Type Locality.—Region of Stanleyville, Belgian Congo: No. 7K above, Kohl Coll.

Holotype.—Soldier (A. M. N. H.).

Described from many soldiers collected together with many workers by Father Kohl. I take pleasure in naming the species in honor of Dr. Claude Fuller, the eminent termitologist.

Nasutitermes (*Nasutitermes*) kohli, new species

Text Figure 38

SOLDIER.—Head reddish yellow; oval; profile nearly straight with a slight elevation at the base of the nose. Two bristles on the vertex and a few short ones at the base of the nose. Antennæ with 12 segments, the third narrower than the fourth or second, the second about equal to the fourth. Mandibles with a distinct point. Nose darker than the head, long and slender. Anterior margin of the pronotum slightly emarginate. Abdominal tergites with short microscopical hair and a row of longer marginal bristles.

Length of head.....	1.33–1.43 mm.
Width of head.....	0.68–0.80
Length of antennæ.....	1.33
Width of pronotum.....	0.37–0.43
Length of hind tibia.....	0.80–0.93

Fairly close to *N. minusculus* but lacks the short hairs on the head and the point of the mandibles is much more conspicuous. *N. elegantulus* close but the cotype has a proportionately wider head.

Type Locality.—Kandolo near Stanleyville, Belgian Congo: No. 70TZ unter, July 13, 1913.

Holotype.—Soldier (A. M. N. H.).

The description is based on many soldiers from Kandolo and also on many soldiers found together with workers and nymphs (No. 3K above, Kohl Coll.) in the same general locality. I take pleasure in naming this interesting species in honor of Father H. Kohl, S.J., whose valuable collection and notes form such an important part of this report.

Under the number "70TZ unter," Father Kohl writes: "these termites build nests of soft carton. The nest is in my collection. It is heart shaped." Under number "3K above" I find this entry: "termites from a carton nest."

Nasutitermes (*Nasutitermes*) santachii, new species

Plate XXVII; Text Figure 39

IMAGOS (Kings and Queens).—Head dark brown; oval; covered with short hair and a few longer bristles. Fontanelle much smaller than the ocelli but conspicuous. Third segment of the antennæ smaller than the fourth or sometimes as long as the fourth, fourth usually smaller than the second but sometimes about equal. Eyes of medium size, fairly close to the lower margin. Ocelli of medium size, not quite their length from the eyes. Postclypeus a little lighter than the head, median line present. Pronotum rather long, same color as head; sides rounded; posterior margin somewhat emarginate. Meso- and metanota a little lighter than the pronotum; hind margins widely emarginate; angles of notches equal to more than a right angle. Abdominal tergites lighter than the pronotum.

Length of head.....	1.43-1.60 mm.
Width of head.....	1.30-1.40
Diameter of eye.....	0.37-0.41
Length of pronotum.....	0.63-0.70
Width of pronotum.....	1.03-1.10
Length of hind tibia.....	1.47-1.53
Length of queen.....	11.00
Width of abdomen of queen.....	3.20

SOLDIER.—Head yellowish with a red-brown nose. Profile of head fairly straight with the back half of the head a little raised but with no conspicuous constriction. Two bristles on the back of the head. Antennæ with 13 segments, the third longer

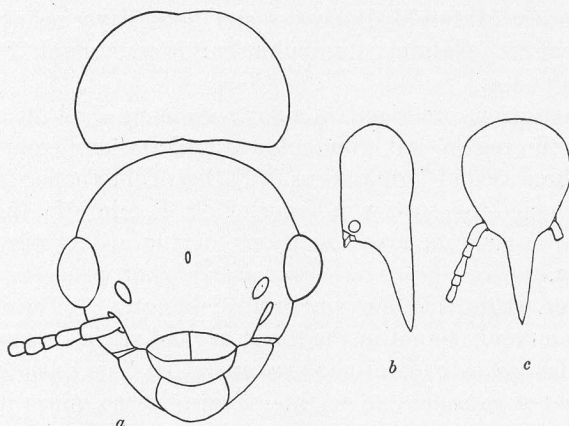


Fig. 39. *Nasutitermes (Nasutitermes) santschii*, new species.

a, head and pronotum of imago from above; *b*, head of soldier from the side; *c*, head of soldier from above.

than the second or the same length, the second longer than the fourth. Mandibles with distinct points. Nose thick, not turned up. Pronotum same color as the head; anterior margin weakly emarginate. Legs same color as the head.

Length of head.....	1.33-1.50 mm.
Width of head.....	0.70-0.82
Length of antennæ.....	1.60
Length of pronotum.....	0.15-0.18
Width of pronotum.....	0.40-0.44
Length of hind tibia.....	1.00

N. bipartitus is similar, but the head is narrower and is somewhat constricted behind the nose. *N. infuscatus* has a wider head and a proportionately shorter nose. Agrees with cotypes of *N. pusillus* (Sjöstedt), but the name *pusillus* is preoccupied by *Eutermes pusillus* Holmgren from Java and *Eutermes pusillus* Heer, a fossil species.

WORKER.—Antennæ with 13 segments, the third showing signs of dividing. Post-clypeus much shorter than half its width.

Width of head.....1.03 mm.

Length of hind tibia.....0.85

Type Locality.—Stanleyville, Belgian Congo: No. 61TZ oben, Kohl Coll.

Holotype.—Queen (A. M. N. H.).

Morphotype.—Soldier (A. M. N. H.).

Other Localities.—Medje, Belgian Congo: No. 715, Lang-Chapin Coll., June, 1914. Region of Stanleyville, Belgian Congo, including the following places: Matombi (Babovoo) on Chopo River near St. Gabriel, Kandolo, near St. Gabriel, Lumbulumbu, Magulumani, St. Gabriel, Kohl Coll., 40 vials.

The descriptions are based on many specimens of all the castes from the Stanleyville region and from soldiers and workers from Medje. I also found three second-form queens in Father Kohl's collection.

I have named this species in honor of Dr. F. Santschi, the authority upon ants, who gave me great assistance during my termite studies in North Africa.

Mr. Lang writes the following in his field notes. "Termites from a structure, commonly found in the forest around sticks or bushes (Plate XXVII). The nests are of various sizes and often close to the ground but are also found at considerable height. There was no queen in this nest. Outside and inside constructed of dirty brown soil. If parts are destroyed, the open cells are repaired at once." (No. 715).

Father Kohl describes the nest several times under the many notes that he took, but I choose the most detailed account which he writes under his number 56TZ below, taken at Matombi on the River Chopo near St. Gabriel on June 17, 1913.

"These termites are called mbèdjè. They attach their nests of carton to trees, bushes and vines. The nest is composed of three parts: (1) an exterior very thin and very fragile layer, which detaches very easily from (2) the hard portion under it: the diameter of this is several centimeters. (3) The central part of the interior is entirely soft, thick, and can be more or less readily extracted from the surrounding mantle formation of 2. This soft section consists of a lighter colored carton than is found in 1 and 2. The queen's cell must be situated in it, but I did not find it. I did find numerous *Aleocharinæ* in it."

Under number "57TZ above," Father Kohl states that "these termites exhale a sharp scent."

In the vials of the Kohl collection I find a large number of Staphylinids, doubtless the Aleocharinæ he mentions. I have also found the fungus parasite, *Termitaria* sp., on soldiers and workers and in one case found it on a queen affecting the head, legs, and mouthparts. In other vials I found white globular masses in the abdomen of workers which I take to be protozoan parasites (*Microsporidia*).

Nasutitermes (?Nasutitermes) minusculus (Sjöstedt)

Text Figure 40

SOLDIER.—Head yellow, nose a little darker; covered with short hairs and a few bristles on the vertex and at the base of the nose. Profile of head straight with a slight elevation at the base of the nose. Antennæ with 12 segments, the third shorter than the second, the second about equal to the fourth. Mandibles with short points. Nose slender and fairly long. Anterior margin of the pronotum very faintly emarginate.

Length of head.....	1.30-1.36 mm.
Width of head.....	0.67-0.74
Length of pronotum.....	0.11
Width of pronotum.....	0.35
Length of hind tibia.....	0.78

The points of the mandibles seem to be too much reduced to fit well into the subgenus *Nasutitermes*, s. str., and I am placing the species in this subgenus with considerable doubt.

WORKER.—Postclypeus about as long as half its width.

Locality.—Malela, Belgian Congo: No. 238, Bequaert Coll., July 4, 1915.

Described from several soldiers taken together with some workers.

Dr. Bequaert gives the following data in his field notes: "from galleries underneath a fallen trunk of a palm tree, in swampy woods along the banks of the Congo."

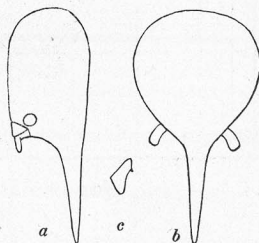


Fig. 40. *Nasutitermes* (?*Nasutitermes*) *minusculus* (Sjöstedt).

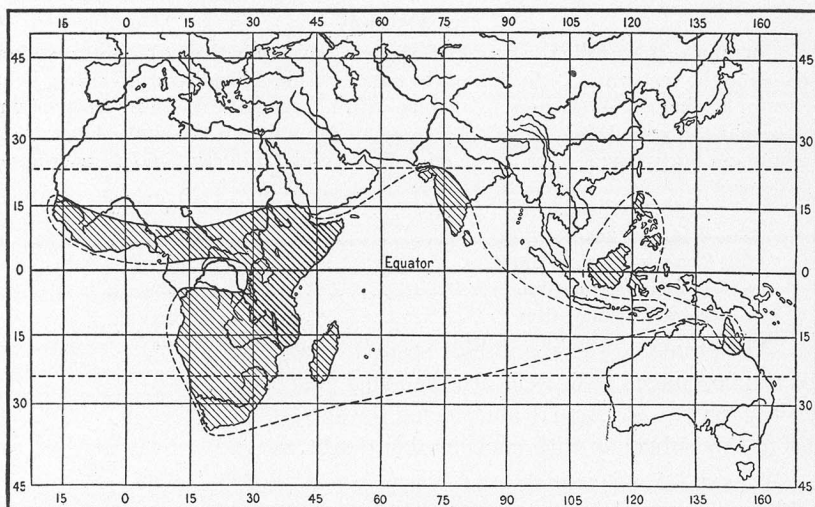
a, head of soldier from the side; b, head of soldier from above; c, mandible of soldier.

Subgenus TRINERVITERMES Holmgren

The distribution of this subgenus (Map 14) is rather peculiar and it is probable that the gaps will ultimately be filled as more extensive collecting is done in the East Indies and Papuan region. I have included the Malagasy region in the map with some doubt based on *N. mitis* known only from the imago. The single record of *N. tripolitanus*, known only from the imago caste from Berek, Tripoli, is included in the

map with a question mark because of its distance from the normal range of the genus and the strong probability that no nasute termites are found in North Africa. The subgenus seems to be absent from the Congo rain-forest, however, probably owing to its feeding habits, which are confined largely to grass.

It is interesting on account of the two distinct soldier castes but the functions of these castes are unknown to me.



Map 14. Distribution of the subgenus *Trinervitermes*.

Nasutitermes (*Trinervitermes*) *carbonarius* (Sjöstedt)

Plate XXVIII; Text Figures 41 and 42

IMAGO.—Head dark red-brown with three yellowish long marks on the back of the head, lighter around the eyes. Fontanelle not large, forked. Antennæ with the third segment longer than the second and the second a little longer than the fourth; fourth, fifth and sixth about equal. Eyes very large and prominent. Ocelli large, 0.33 mm. long and 0.055 mm. from the eyes. Labrum yellow. Postclypeus yellow, contrasting with the head; median line faint. Pronotum yellow, contrasting with the head; hind margin somewhat emarginate. The posterior margins of the meso- and metanota widely and rather deeply emarginate; angles rather sharp.

Length without wings (king).	10.00 mm.
Length of head.	2.40
Width of head.	2.12
Diameter of eye.	0.78
Length of pronotum.	1.11

Width of pronotum.....	2.00 mm.
Length of hind tibia.....	2.67
Length of queen.....	16.00
Width of abdomen of queen.....	6.00

Very close to the cotype of *N. occidentalis*, but *N. carbonarius* is much larger. In *N. somaliensis* the second segment of the antennæ is longer than the third.

MAJOR SOLDIER.—Head dark red-brown, the nose a little darker. Tip of the nose and the base of the antennæ a little lighter. Head subglobular excluding the nose which is long and robust; profile concave; the hind margin of the base of the antenna

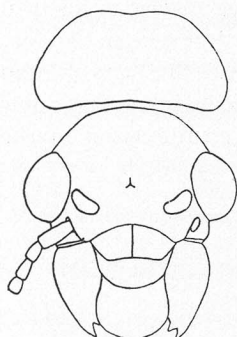


Fig. 41

Fig. 41. *Nasutitermes (Trinervitermes) carbonarius* (Sjöstedt).

Head and pronotum of imago from above.

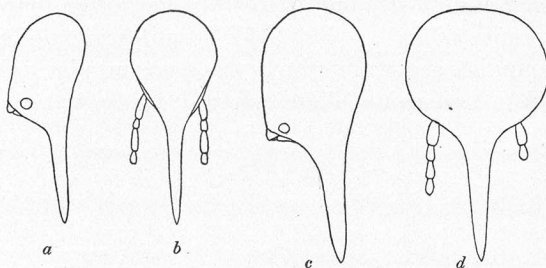


Fig. 42

Fig. 42. *Nasutitermes (Trinervitermes) carbonarius* (Sjöstedt).

a, head of minor soldier from the side; b, head of minor soldier from above; c, head of major soldier from the side; d, head of major soldier from above.

behind the middle of the head. Antennæ with 14 segments, the third equal to the fourth or slightly longer, sometimes just dividing from the fourth; the second shorter than the fourth. Anterior margin of the pronotum very weakly emarginate, nearly evenly curved.

Length of head.....	2.50–2.60 mm.
Width of head.....	1.40–1.60
Length of pronotum.....	0.38
Width of pronotum.....	0.69
Length of hind tibia.....	1.76–1.80

Agrees perfectly with cotypes. Close to *N. bulbiceps* and *N. trinerviformis* but the head is darker. *N. holmgreni* and *N. posselensis* are smaller.

MINOR SOLDIER.—Head dark brown, nose black; very light around the base of the antennæ. Antennæ with 13 segments, the third over double the length of the second, sometimes showing signs of dividing; the fourth a little longer than the second.

Length of head.....	1.90-1.95 mm.
Width of head.....	0.80
Length of hind tibia.....	1.47

WORKER.—Antennæ with 15 segments:

Width of head.....	1.67 mm.
Length of hind tibia.....	1.67

Locality.—Faradje, Belgian Congo: No. 276, Lang-Chapin Coll., April, 1911; Nos. 317, 318, Lang-Chapin Coll., Jan., 1912.

Described from numerous major and minor soldiers, workers and a single king and queen.

Lang includes the following observations on this species in his field notes: “(No. 276) termites from low roundish structures seldom two feet high and mostly only 8 to 10 inches, often found near the base of large termite hills.” “(No. 317) Termites including queen taken from low roundish structure which was cast in plaster for reproduction in the *Rhinoceros* group (Plate XXVIII, fig. 2).”

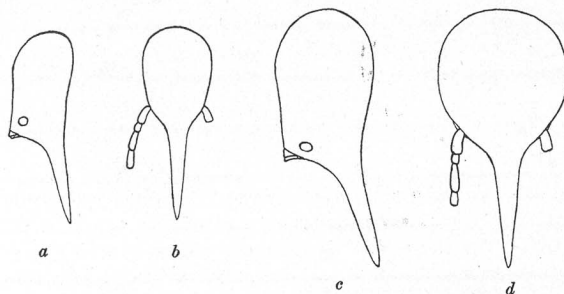


Fig. 43. *Nasutitermes (Trinervitermes) roseni* (Holmgren).

a, head of minor soldier from the side; b, head of minor soldier from above; c, head of major soldier from the side; d, head of major soldier from above.

Nasutitermes (Trinervitermes) roseni (Holmgren)

Text Figure 43

MAJOR SOLDIER.—Head reddish yellow, nose somewhat darker; oval excluding the nose which is rather slender. Profile of head concave, sometimes not quite as concave as shown in Figure 43. Hind margin of the base of the antenna a little in back of the middle of the head. Antennæ with 13 segments, the third double the length of the second, the second equal to the fourth. Anterior margin of the pronotum evenly rounded.

Length of head.....	2.20-2.67 mm.
Width of head.....	1.14-1.38
Length of pronotum.....	0.26-0.29
Width of pronotum.....	0.56-0.67
Length of hind tibia.....	1.44-1.58

N. agricola very close and may be the same species but it seems to differ from *N. roseni* in the proportionately wider head and the 13-segmented antennæ of the minor soldier. The specimens agree perfectly with the description of *N. muneris* and I believe these two species are synonymous. Soldiers of *Eutermes diplacodes* from Moanda agree perfectly with the above species and I am placing *E. diplacodes* in synonymy with *N. roseni*. The imago from Moanda, however, is certainly not a *Trinervitermes*.

The major soldiers vary considerably in size.

MINOR SOLDIER.—Antennæ with 12 segments, the third equal to the fourth, the fourth sometimes showing signs of dividing.

Length of head.....	1.55-1.60 mm.
Width of head.....	0.64-0.68
Length of hind tibia.....	1.24-1.33

This species is described by Holmgren from Rhodesia. My specimens from the Congo, however, answer his description and both the major and minor soldiers run to this species in his keys (1913b, p. 348). *N. muneris* was recorded from Boma.

Localities.—Matadi, Belgian Congo: No. 205, Bequaert Coll., June 18, 1915. Boma, Belgian Congo: Lang-Chapin Coll., June 18, 1915. Banana, Belgian Congo: Lang-Chapin Coll., July, 1915. St. Antonio, Angola: Lang-Chapin Coll., August, 1915.

Described from many major and minor soldiers collected from the above localities.

Dr. Bequaert makes the following remarks on the specimens from Matadi: "from a clay nest that was but little raised above the surface of the soil and whose galleries were coated with a blackish material (fungi?); in the rocky, dry savannah." Probably the blackish material was not fungus, as these are not fungus-growing termites. They do gather grass leaves, however, and the material referred to may be decomposed vegetable matter.

I find the following observations in Lang's field notes from Banana: "near Kifuku, in a swamp from a conical structure." The following entry is also made for the specimens from St. Antonio: "In sandy ground; termites that carry loose sand about the firmly made center of the inner nest. Some of the tunnels are filled with small particles of vegetable matter."

It is rather interesting to note that this species is found in dry savannah regions in one case and in a swamp in another case.

Nasutitermes (Trinervitermes) bettonianus (Sjöstedt)

Text Figures 44a and b

MAJOR SOLDIER.—Head reddish yellow; profile concave; base of antenna in front of the middle of the head; no longitudinal furrow in the back of the head. Antennæ with 13 segments, third usually double the length of the fourth; sometimes the fourth is incompletely divided and sometimes the fourth is nearly as long as the third. Nose proportionately shorter than in subspecies *sulciceps*; thick. Anterior margin of the pronotum with a conspicuous emargination.

Length of head.....	2.33-2.58 mm.
Width of head.....	1.40-1.44
Length of pronotum.....	0.28
Width of pronotum.....	0.67
Length of hind tibia.....	1.44

Differs from the subspecies *sulciceps* in not having a furrow in the back of the head and in having a shorter nose. *N. ruficeps* and *N.*

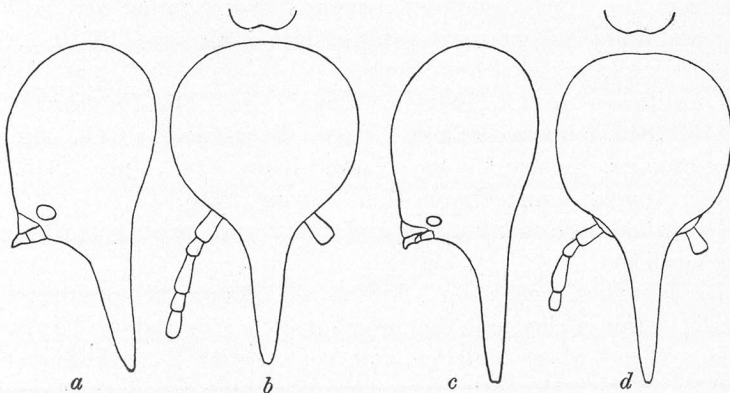


Fig. 44. *a*, *Nasutitermes (Trinervitermes) bettonianus* (Sjöstedt), head of major soldier from the side; *b*, head of major soldier from above; *c*, *Nasutitermes (Trinervitermes) bettonianus*, subspecies *sulciceps*, new subspecies, head of major soldier from the side; *d*, head of major soldier from above.

gemellus, form *kalaharicus* are smaller. After a careful comparison of the cotypes of *N. bettonianus* and *N. brutus*, I believe the two species are synonymous. The size differences are found within the same colony and I can find no differences in the front margin of the pronotum of the minor soldier in the cotype specimens.

MINOR SOLDIER.—Antennæ with 12 segments, the third about equal to the fourth the second smaller. The anterior margin of the pronotum is conspicuously emarginate

Length of head.....	1.67-1.78 mm.
Width of head.....	0.72-0.84
Length of hind tibia.....	1.27-1.38

Locality.—Thysville, Belgian Congo: Lang-Chapin Coll., June 1, 1915; Bequaert Coll., Nos. 188, 189, June 3, 1915.

The description is based on numerous major soldiers and minor soldiers.

Dr. J. Bequaert states in his field notes that these termites were obtained "from galleries in clay soil, in the dry rocky savannah country" at Thysville.

**Nasutitermes (Trinervitermes) bettonianus
sulciceps, new subspecies**

Plate XXXIII; Text Figures 44c and d

MAJOR SOLDIER.—Head reddish yellow-brown, nose somewhat darker; profile concave; back of head with a slight shallow groove. Base of antennæ in front of the middle of the head. Antennæ with 13 segments, the third double the length of the fourth, the second nearly equal to or slightly shorter than the fourth, the third equal to the basal segment. Nose stout and fairly long. Anterior margin of the pronotum conspicuously emarginate.

Length of head.....	2.35-2.44 mm.
Width of head.....	1.26-1.44
Length of pronotum.....	0.32
Width of pronotum.....	0.65-0.67
Length of hind tibia.....	1.55

Differs from the typical species in the presence of a groove in the back of the head and in the longer nose.

MINOR SOLDIER.—Antennæ with 12 segments, the third nearly double the length of the second, the fourth a little shorter than the third. Anterior margin of the pronotum not nearly as deeply cut as in the major soldier.

Length of head.....	1.55-1.68 mm.
Width of head.....	0.64-0.68
Length of hind tibia.....	1.22-1.25

Type Locality.—Garamba, Belgian Congo: Nos. 461, 462, Lang-Chapin Coll., July, 1912.

Holotype.—Major soldier (A. M. N. H.).

Morphotype.—Minor soldier (A. M. N. H.).

Taken from nest of *M. (Cubitermes) sankurensis* (Plate XXXIII), at Garamba.

Nasutitermes (Trinervitermes) lutzi, new species

MAJOR SOLDIER.—Head reddish yellow-brown, very close in shape to *N. bettonianus*. Base of antennæ in front of the middle of the head. Profile of head concave. Antennæ with 13 segments, same as in *N. bettonianus*. Anterior margin of the pronotum not emarginate, nearly evenly curved.

Length of head.....	2.33-2.44 mm.
Width of head.....	1.33-1.39
Length of pronotum.....	0.27
Width of pronotum.....	0.67
Length of hind tibia.....	1.44



Map 15. Distribution of the subgenus *Coarctotermes*.

Differs from *N. bettonianus* and *N. bettonianus* subsp. *sulciceps* in the lack of a conspicuous emargination in the anterior margin of the pronotum. *N. pius*, *N. gemellus*, *N. dispar* and *N. rufonasalis* are smaller. *N. agricola* has smaller measurements and the antennal base is in the middle of the head. *N. maudanicus* is close but has a more slender nose at the base.

MINOR SOLDIER.—Antennæ with 12 segments. Anterior margin of the pronotum not emarginate but is evenly rounded. Differs from the minor soldier of *N. agricola* in the 12-segmented antennæ.

Type Locality.—Niagara, Belgian Congo: Nos. 597, 598, Lang-Chapin Coll.; May 20, 1913.

Holotype.—Major soldier (A. M. N. H.).

Morphotype.—Minor soldier (A. M. N. H.).

Described from several major soldiers and several minor soldiers from vials containing several species taken from a nest of *Macrotermes natalensis*.

Subgenus **COARCTOTERMES** Holmgren

I believe that this name should be spelled as above, since every reference in Holmgren (1912) is spelled in this way with one exception, which is spelled *Coarctatotermes*. This was evidently a misprint.

The subgenus is found over a great part of the Ethiopian and Malagasy regions (Map 15) but is absent from the rain-forest of the Congo basin according to present records. Sjöstedt (1926, 1926b) has reported *N. contractus* from Tumbwe, Belgian Congo and *N. coarctatus* from Dika and Mauda, French Congo, since the map was completed.

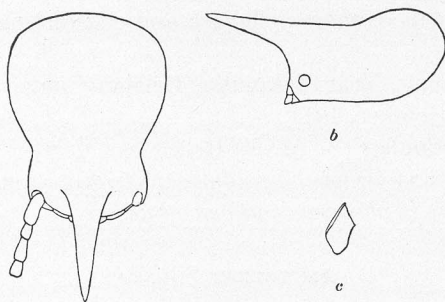


Fig. 45. *Nasutitermes* (*Coarctotermes*) *suffuscus*, new species.
a, head of soldier from above; b, head of soldier from the side; c, mandible of soldier.

Upon reading the description of *Eutermes doriae* Silvestri, which Holmgren referred to *Hospitalitermes*, I believe this species had best be included in *Coarctotermes* even though the antennal segments seem proportionately longer than in the other species of this subgenus. The mandibles of the soldier of *E. doriae* have a short point instead of the long point on the mandibles of *N. hospitalis*.

Nasutitermes (Coarctotermes) suffuscus, new species

Text Figure 45

SOLDIER.—Head reddish yellow-brown with a darker nose; conspicuously constricted in the middle; two hairs on the vertex. The specimens before me have broken antennæ; one, however, has 13 segments in which the last segment does not seem to be the terminal segment. The third segment is longer than the second or fourth but is not double the length of the second as in *N. doriæ*. Mandibles with very small points which are barely distinguishable. Thorax about the same color as the head. Legs not particularly long in proportion to the body.

Length of head.....	1.39–1.47 mm.
Width of head.....	0.78
Length of pronotum.....	0.18
Width of pronotum.....	0.44
Length of hind tibia.....	1.10

Much smaller than *N. doriæ* and the third segment of the antennæ is not double the length of the second. *N. coarctatus* cotype has a smaller head in back of the constriction and the nose is proportionately thicker. *N. clepsydra* has a black head. The profile of *N. bipartitus* is straighter. *N. tenebricus* is close but the head is longer and the mandibles are without points. *N. contractus* cotype soldier has a somewhat less angulate constriction from above, a thicker nose from both top and side, and the profile without a distinct bump at the base of the nose. The color of the head of *N. contractus* is more yellowish and contrasting with the thorax and abdomen.

Type Locality.—Near Yakuluku, Belgian Congo: No. 302, Lang-Chapin Coll., December, 1911.

Holotype.—Soldier (A. M. N. H.).

Described from four nasute soldiers taken from a mushroom-shaped nest of *Mirotermes (Cubitermes) orthognathus*.

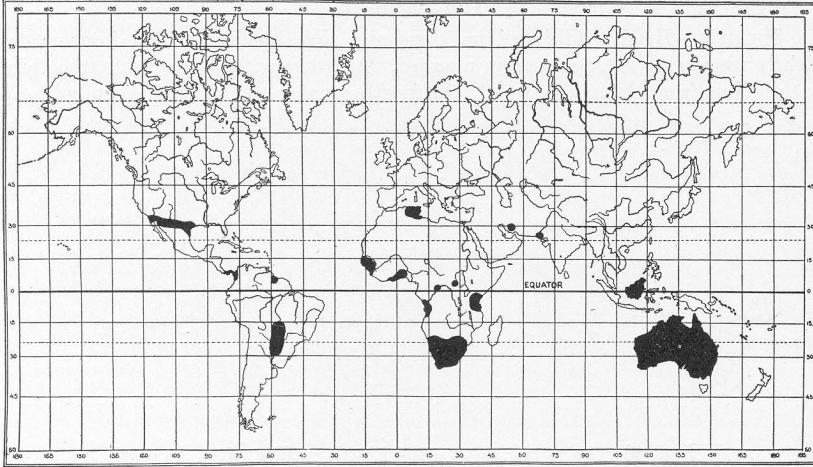
AMITERMES Silvestri

Silvestri changed the spelling of this name two years after the first description to *Hamitermes*. Although this spelling has been accepted by the majority of termitologists, I cannot see how it can be retained if we are to abide by the International Code. I have therefore followed Banks (Banks and Snyder 1920) in retaining the original spelling.

Subgenus **AMITERMES** Holmgren

This is the only subgenus of *Amitermes* found in the Ethiopian region, where twenty-five species have been recorded, outnumbering those known from any other region. The subgenus has a decidedly dis-

continuous distribution (Map 16), the gaps of which may be partially filled up with more extensive collecting. Since completing the map, records have been added from the following localities: Guatemala, Mixco; Liberia; Fundu I.; Belgian Congo, Elizabethville; Rhodesia; Somaliland; Sumatra; Malacca. The subgenus has crept into the temperate regions in several cases, a number of species being know



Map 16. Distribution of the subgenus *Amitermes*, s.str.

from southwestern United States, while only one species was found by me in the rain-forest of British Guiana.

Two species are represented in the collections from central Africa, both of which I have referred to species previously described by Silvestri.

***Amitermes* (*Amitermes*) *evuncifer* Silvestri**

Text Figure 46

SOLDIER.—Head reddish yellow; sides slightly rounded. Antennæ with 15 segments, the third very short, barely divided from the fourth; the fourth equal to the fifth; the second equal to the third and fourth together. Labrum rather pointed at the tip. Mandibles strongly curved, tooth truncated. Anterior margin of the pronotum very slightly or not at all emarginate.

Length of head.....	2.30–2.40 mm.
Width of head.....	1.18
Length of pronotum.....	0.33
Width of pronotum.....	0.67
Length of hind tibia.....	1.00
Length of left mandible.....	0.67

Locality.—Niagara, Belgian Congo; No. 597, Lang-Chapin Coll., May 20, 1913.

Described from numerous soldiers found in a vial containing many specimens of *Macrotermes natalensis* together with a number of other species.

Amitermes (Amitermes) elongatus Silvestri

Text Figure 47

SOLDIER.—Head reddish yellow; long and slightly narrowed in front; sides slightly rounded; posterior margin rounded. Antennæ with 15 segments, the third just dividing from the fourth, small; the fourth equal to the fifth. Labrum with tip

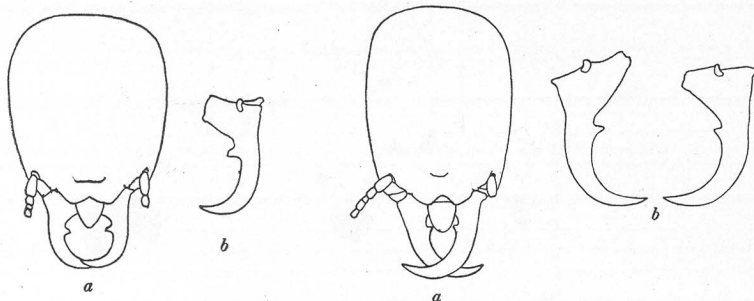


Fig. 46

Fig. 46. *Amitermes (Amitermes) evuncifer* Silvestri.

a, head of soldier from above; b, left mandible of soldier.

Fig. 47

Fig. 47. *Amitermes (Amitermes) elongatus* Silvestri.

a, head of soldier from above; b, mandibles of soldier.

rounded. Mandibles strongly curved, teeth pointing backwards, rounded points on the teeth. Anterior margin of the pronotum somewhat emarginate.

Length of head.....	2.45–2.55 mm.
Width of head.....	1.16
Length of antennæ.....	1.72
Length of pronotum.....	0.39
Width of pronotum.....	0.77
Length of hind tibia.....	1.16
Length of left mandible.....	0.81

Silvestri's (1914) figure of the mandibles of *A. elongatus* shows less curve in the mandibles than in the specimens before me. However, the description and other figures are so close that I believe they are the same species.

A. unidentatus and *A. desertorum* are smaller. The teeth of the left mandibles are not as sharp in *A. meruensis*. The shape of the mandibles

is entirely different in *A. runconifer*. The head is shorter in *A. lönnbergianus*.

Localities.—Zambi, Belgian Congo: No. 218, Bequaert Coll., June 21, 1915. Pasaconde near Zambi, Belgian Congo: No. 224, Bequaert Coll., June 22, 1915.

Described from several soldiers collected by Dr. Bequaert.



Map 17. Distribution of the genus *Thoracotermes*. ○ refers to *T. brevinotus*; + refers to *T. macrothorax*.

Dr. Bequaert took the following field notes: "No. 218. From galleries constructed between the bark and the wood of a pole in the station of Zambi. The space between the bark evidently had been gnawed away by the termites and filled in again with black, very hard soil, in which rather broad galleries and chambers were left; the galleries also extended into the pole itself."

Concerning No. 224, Dr. Bequaert writes: "from a nest in a decaying trunk of a palm tree (*Hyphæne*) in the grass country."

THORACOTERMES Wasmann

This genus is known from only two species, one of which, *T. brevinotus*, is recorded only from Mamou, French Guinea (Map 17, circle). The other species, *T. macrothorax*, is known from a number of localities (Map 17, crosses) throughout the West African subregion in and on the borders of the rain-forests. Since completing the map, Sjöstedt (1926) has added the following localities for *T. macrothorax*: French Congo: Indo, Dika; Belgian Congo: Kamaiembi, Makesia, Lukula, Go (Lower Uele).

Thoracotermes macrothorax (Sjöstedt)

Text Figure 48

SOLDIER.—Head reddish yellow, somewhat darker in front than behind; sides somewhat rounded, converging slightly toward the front. Antennæ with 15 segments, the third shorter than the fourth, the fourth shorter than the second. Labrum tongue-shaped, tip rounded with numerous long hairs. Mandibles black; tips curved; inner edge without teeth except near the base. Fontanelle conspicuous. A small bunch of hairs near the fontanelle. Pronotum conspicuously wide with flat extensions on each side; sides rounded, converging toward the rear; posterior margin concave. Mesonotum much narrower than pronotum. Metanotum wider than mesonotum but much narrower than pronotum. Abdominal tergites smooth without conspicuous hairs or bristles. Sternites with very short hairs which are barely visible.

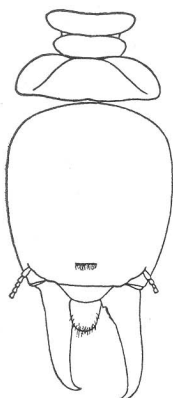


Fig. 48. *Thoracotermes macrothorax* (Sjöstedt).

Head and thorax of soldier.

Total length.....	9.00–10.00 mm.
Length of head with mandibles.....	4.70– 4.80
Length of head without mandibles.....	3.80
Width of head.....	2.78
Length of antennæ.....	2.57
Length of pronotum.....	0.85
Width of pronotum.....	2.35
Length of hind tibia.....	1.90
Length of left mandible.....	1.08

Differs from *T. brevinotus* in the shape of the pronotum. *T. brevinotus* is also slightly smaller.

There is good reason to doubt the authenticity of all imagos referred to this species. In Sjöstedt's collection there are at least two species of imagos with the soldiers and neither is close to the queen of *T. brevinotus* which seems to be undoubtedly associated with soldiers of this genus.

Localities.—Bipindi, Cameroon: Nos. 52, 54, and 59, G. Zenker Coll., 1920. Senegambina, Cameroon: No. 247, B. C. Z. Evans Coll., April 25, 1920. Region of Stanleyville, Belgian Congo: Nos. 1T and 82TZ, Kohl Coll., 1916.

The description is based on many soldiers from these localities.

JUGOSITERMES, new genus

The species before me differs so markedly from any genus known that I have referred it to a new genus with no hesitation. It is closest to *Apicotermes* and *Allognathotermes* but differs from both in the steep forehead and conspicuous ridges over the base of the antennæ. The mandibles are proportionately very broad, much broader than either *Apicotermes* or *Allognathotermes*, and the left mandible possesses small teeth. The gland opening is present but is inconspicuous. The labrum is proportionately very small. The head has parallel sides. The antennæ possess 15 segments. The prothoracic tibiæ have three spines at the apex and the meso- and metathoracic tibiæ have two spines at the apex. No pulvillus is present between the claws of the tarsi. The coxæ of the prothoracic legs have a large conspicuous tooth-like projection.

Type Species.—*Jugositermes tuberculatus*, new species.

Nothing is known of the biology of this form.

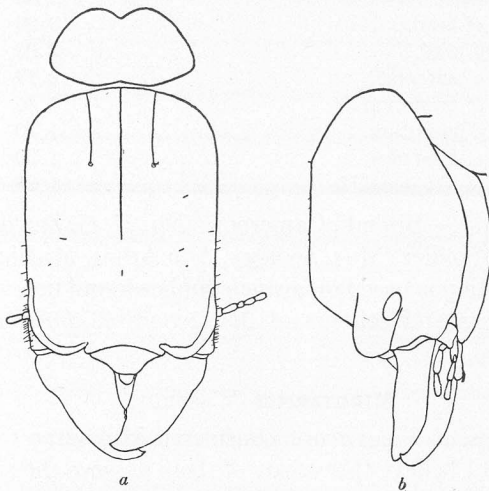


Fig. 49. *Jugositermes tuberculatus*, new species.
a, head and pronotum of soldier from above; b, head of soldier from the side.

Jugositermes tuberculatus, new species

Text Figure 49

SOLDIER.—Head reddish yellow-brown, darker in front, a dark line running from the middle of the head to the back. Head rectangular; sides parallel; posterior margin rounded. Two conspicuous ridges above the base of the antennæ and less conspicuous ridges below so that the base of the antenna is set in one end of a groove.

Forehead sloping at an angle of 45°. Two small pimple-like elevations on the vertex on either side of the median line, plainly visible from the side. Very few hairs on the head, numerous bristles on the sides below the antennæ. Antennæ with 15 segments, the third very short, shorter than the fourth, the fourth shorter than the second. Labrum very small, tongue-shaped, inconspicuous. Mandibles very large and broad, proportionately short; very short teeth on the inner margins of both mandibles. Frontal gland opening barely visible as a dot slightly in front of the median line.

Numerous long bristles on the margins of the pronotum, more numerous on the anterior margin. The anterior margin also has numerous short hairs. Pronotum narrower than the head, saddle-shaped; sides fairly straight, converging toward the rear; posterior margin deeply emarginate with rounded angles; anterior margin emarginate; a longitudinal groove in the middle of the pronotum, deep where it joins the anterior and posterior margin but shallow in the middle.

Coxa of front leg with a large conspicuous tooth-like projection in front and to the side. Front tibia with three apical spines; meso- and metathoracic tibiæ with two apical spines. Abdominal tergites and sternites covered with many long bristles and many shorter hairs. Sternites and tergites with similar pilosity, the bristles of the tergites being no shorter than those of the sternites.

Total length.....	8.50 mm.
Length of head.....	3.86
Width of head.....	2.03
Length of antennæ.....	2.14
Length of pronotum.....	0.86
Width of pronotum.....	1.70
Length of hind tibia.....	1.30
Length of left mandible.....	1.28

Type Locality.—Bipindi, Cameroon: No. 27, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoölogy, Ann Arbor, Michigan).

The description is based on a single soldier found in a vial containing numerous workers and soldiers of *Mirotermes* (*Cubitermes*) *fungifaber* (Sjöstedt).

MIROTERMES Wasmann

For the present I have not considered Holmgren's subgenera as genera, although I believe that many of them deserve the rank of genera. The group needs revision as a whole before I can decide which of the subgenera should be treated as genera and which not. There is no doubt in my mind that Silvestri's group *Ceratotermes* is entirely distinct from the South American *Labiotermes* and I am here treating *Ceratotermes* as a subgenus of *Mirotermes*.

Subgenus **EUCHILOTERMES** Silvestri

This group up to the present time has been known only from one species and its varieties, *E. tensus* Silvestri, which he described as a new genus in 1914. This species and its varieties were recorded by Silvestri

from French Guinea and the Gold Coast. A single soldier found in a vial with *Mirotermes* (*Cubitermes*) *orthognathus* taken from a mushroom-shaped nest is so distinct from *M. (Euchilotermes) tensus* that I am describing it as a new species. An examination of the type material convinces me that the variety *acutidens* deserves specific rank. The mandibles are more prolonged and curved at the tip than in *M. tensus*, the teeth are smaller and sharper and the gula is wider. The variety *arcuatus* is closer to the typical *M. tensus*, however, and I am not considering it as specifically distinct.

***Mirotermes* (*Euchilotermes*) *quadriceps*, new species**

Text Figure 50

SOLDIER.—Head yellowish, antennæ and labrum pale, mandibles dark. Sides and posterior margin of the head straight, head narrowed somewhat in front. Antennæ with 15 segments, the first as long as the second, third and fourth together; the second

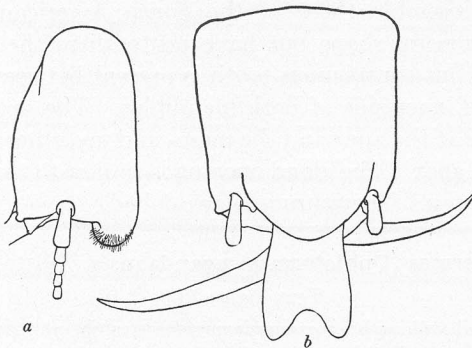


Fig. 50. *Mirotermes* (*Euchilotermes*) *quadriceps*, new species.

a, head of soldier from the side; b, head of soldier from above.

longer than the third; the third and fourth about equal. Labrum very large with two large rounded lobes at the end. Mandibles long and slender, somewhat curved inwards. A tooth near the base of each mandible. A large rounded projection near the frontal gland opening in the front of the head. Anterior margin very slightly emarginate.

Length of head to end of nose.....	1.50 mm.
Length of head to base of antennæ.....	1.16
Width of head.....	1.33
Length of antennæ.....	1.89
Length of pronotum.....	0.30
Width of pronotum.....	0.67
Length of hind tibia.....	1.00
Length of left mandible (inexact).....	1.67

The mandibles are more curved in *M. tensus* and *M. acutidens* and the heads are proportionately longer and not as narrowed in front.

Type Locality.—Near Yakuluku, Belgian Congo: No. 303, Lang-Chapin Coll., December, 1911.

Holotype.—Soldier (A. M. N. H.).

The description is based on a single soldier collected by Mr. Lang from a mushroom-shaped nest of *Mirotermes* (*Cubitermes*) *orthognathus*, together with several other species of termites.

Subgenus **OPHIOTERMES** Sjöstedt

I have included in this subgenus two new species found in the collections from central Africa. Sjöstedt (1924a) made *M. mandibularis* the genotype. *Ophiotermes* differs from the other subgenera of *Mirotermes* and closely related genera, in the shape of the mandibles, which are bent outward near the middle and are somewhat curved inwards near the tip. The mandibles resemble those of the South American genus *Orthognathotermes* in general shape but have no tooth in the middle at the elbow. A small, but conspicuous tooth is present between the base and the elbow on the inner side of both mandibles. The prothoracic tibiae have three spines at the apex and the meso- and metathoracic tibiae have two spines at the apex. The gland opening is similar to that found in the subgenus *Cubitermes*. The labrum is two-lobed.

***Mirotermes* (*Ophiotermes*) *ugandaensis* (Sjöstedt)**

Text Figure 51

SOLDIER.—Head yellowish; rectangular; sides straight and parallel; posterior margin somewhat rounded; front vertical. Antennæ with 14 or 15 segments; if with 14 segments, the second and third are about equal, fourth shorter than third; if with 15 segments, the third is a little shorter than the fourth, fourth shorter than second. Labrum two-lobed, sides straight and parallel. Mandibles long, bent outwards in the middle; tip curved inwards and a small tooth on the inner edge of each mandible half-way from the base to the elbow. Nose blunt, surrounded by short hair, similar to *Cubitermes*, *s.str.* Sides of pronotum straight, converging strongly toward the rear; posterior margin somewhat emarginate. Abdominal tergites covered with short hairs and with longer bristles on the posterior margins. Sternites with long hairs.

Total length.....	6.00–7.00 mm.
Length of head with mandibles.....	4.00
Length of head to tip of labrum.....	2.30
Width of head.....	1.44
Length of antennæ.....	2.44
Width of pronotum.....	0.89
Length of hind tibia.....	1.00
Length of left mandible.....	2.40–2.50

Very close to *M. mirandus* but differs in the shape of the pronotum and mandible. The labrum of *M. mirandus* is proportionately shorter and more deeply cut and the mandibles are bent about two-thirds of their length from the base and are straighter, while those of *M. ugandaensis* are bent in the middle. The outer half of the inner margin of the mandible of *M. ugandaensis* is straighter than in either *M. mandibularis* or *M. mirandus*.

Locality.—Garamba, Belgian Congo: No. 371, Lang-Chapin Coll., March 19, 1912.

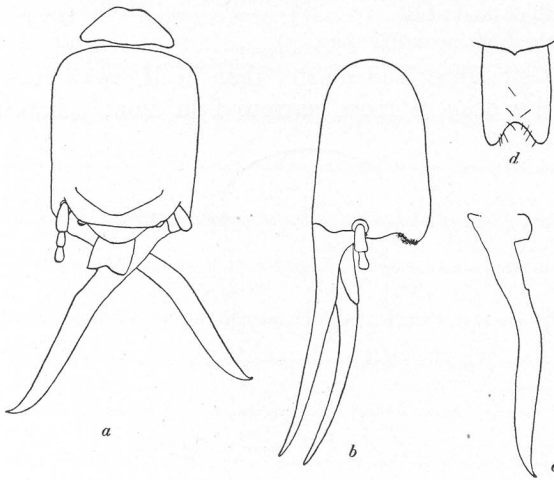


Fig. 51. *Mirotermes (Ophiotermes) ugandaensis* (Sjöstedt).

a, head and pronotum of soldier from above; *b*, head of soldier from the side; *c*, right mandible of soldier; *d*, labrum of soldier.

The description is based upon two soldiers taken from a vial containing *Mirotermes (Cubitermes) antennalis*. The nest from which these termites were taken is described in Lang's field notes as "a conical structure about 12 inches high." This nest was doubtless built by *M. antennalis*.

***Mirotermes (Ophiotermes) grandilabius*, new species**

Text Figure 52

SOLDIER.—Head reddish yellow; rectangular; slightly narrowed in front; posterior margin rounded. Projection above the fontanelle smaller than in *M. quadriceps*. Antennæ with 14 segments, the third sometimes just dividing, the third longer than the second, the second equal to the fourth. Labrum large, bilobed, the tips of the lobes more pointed than in *M. tensus* or *M. quadriceps*. Mandibles nearly

straight except for the incurving tips; slightly curved outward about two-thirds of their length from the base. Mandibles dark red-brown, much the same color as the head; a small but distinct tooth about one-fourth the length of the mandible from the base on each mandible. Anterior margin of the pronotum hardly or not at all emarginate.

Length of head with mandibles.....	3.33 mm.
Length of head to end of nose.....	1.57
Width of head.....	1.33
Length of antennæ.....	2.20-2.30
Length of pronotum.....	0.33
Width of pronotum.....	0.80
Length of hind tibia.....	1.11
Length of left mandible (inexact).....	1.89

Mandibles straighter and shorter than in *M. ugandaensis*. In *M. mandibularis* the head is more narrowed in front. Labrum of *M.*

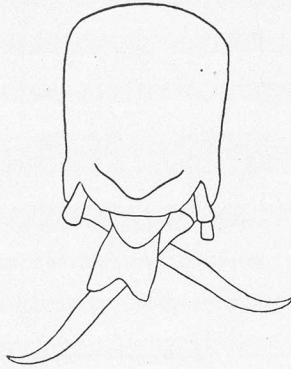


Fig. 52. *Mirotermes (Ophiotermes) grandilabius*, new species.
Head of soldier from above.

grandilabius much larger than either *M. mirandus* or *M. mandibularis*, approaching the subgenus *Euchilotermes* in this respect.

WORKER.—Antennæ with 14 segments, the third sometimes dividing.

Width of head.....0.92 mm.

Length of hind tibia.....0.83

Type Locality.—Bipindi, Cameroon: No. 26, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoology, Ann. Arbor, Mich.).

The descriptions are based on three soldiers and numerous workers.

Subgenus **CUBITERMES** Wasmann

This subgenus is confined to the Ethiopian region (Map 18), where it is represented by 61 species, more species than are known from any

other subgenus of termites from the same region except *Termes*, *s.str.*, which has 64 recorded from the Ethiopian region.

The distribution records show that the group is found throughout the Ethiopian region except in the arid parts to the north and northeast and in the southwest from which no species have ever been recorded (Map 18).



Map 18. Distribution of the subgenus *Cubitermes*.

Some of the species build the interesting mushroom-shaped nests recorded so often in the literature (Plates XXX, XXXI and XXXII).

The species of this subgenus are very difficult to differentiate from each other and it is nearly impossible to determine them with accuracy from the descriptions alone.

I have found it helpful to have a measure of the curvature of the mandibles, as the slight variations in curvature seem very useful in the identification of the various species. I have thus added to the descriptions a measurement which is taken by placing the left mandible in a

natural position on a plane surface, then measuring with a micrometer the distance between an imaginary base line running from the tip of the mandible to the basal projection, and the edge of the mandible at the point of greatest curvature.

***Mirotermes (Cubitermes) sulcifrons* Wasmann**

Text Figure 53

SOLDIER.—Sides of head straight, converging somewhat toward the front; posterior margin only slightly rounded. Antennæ with 15 segments, the third shorter than the fourth, the fourth somewhat shorter than the second. Labrum very deeply

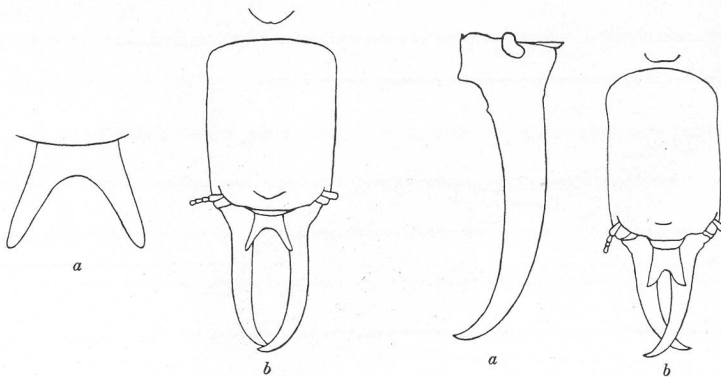


Fig. 53

Fig. 54

Fig. 53. *Mirotermes (Cubitermes) sulcifrons* Wasmann.

a, labrum of soldier; b, head and front margin of pronotum of soldier from above.

Fig. 54. *Mirotermes (Cubitermes) kemneri*, new species.

a, left mandible of soldier; b, head and front margin of pronotum of soldier from above.

cut with the two processes very thin. Mandibles rather strongly curved. Anterior margin of the pronotum very slightly emarginate.

Length of head with mandibles.....	5.80 mm.
Length of head to tip of labrum.....	4.40
Length of head to the rear margin of antennal base..	2.80
Width of head.....	2.54
Length of antennæ.....	5.20
Length of pronotum.....	0.64
Width of pronotum.....	1.30
Length of hind tibia.....	2.18
Length of left mandible.....	2.80
Curvature of mandible.....	0.40

Cotypes of *M. sulcifrons* have a less deeply cut labrum, but otherwise agree perfectly. *M. domifaber* smaller. *M. intercalatus* very close but

the labrum of *M. intercalatus* is not so deeply cut and the mandibles are more curved at the tip and are a little shorter. The description of *M. kemneri* is fairly close but the mandibles are only slightly curved and the front lobe of the pronotum is not cut in the middle. Very close to *M. hamatus* but larger.

WORKER.—Antennæ with 15 segments.

Width of head.....1.32 mm.
Length of hind tibia.....1.50

Locality.—Senegambina, Cameroon: No. 48, R. N. Evans Coll., April 24, 1920.

Described from a single soldier and numerous workers.

***Mirotermes (Cubitermes) kemneri*, new species**

Text Figure 54

SOLDIER.—Head reddish yellow, darker in front; head slightly constricted near the posterior margin; sides parallel, not converging in front. Antennæ with 15 segments, the third shortest, the fourth very slightly shorter than the second. Mandibles of median curvature, tip fairly strongly curved. Pronotum with a very slight emargination in front.

Length of head with mandibles.....6.10 mm.
Length of head to hind margin of antennal
bases.....3.00-3.20
Width of head.....2.25-2.28
Length of antennæ.....3.20
Length of pronotum.....0.64
Width of pronotum.....1.41
Length of hind tibia.....1.89
Length of left mandible.....2.67
Curvature of left mandible.....0.37

Very close to *M. heghi* but the mandibles are a little more slender and the shape at the base is a little different. The tips of the mandibles of *M. finitimus* are more strongly curved. *M. zenkeri* is close but has straighter mandibles.

Type Locality.—Bipindi, Cameroon: No. 14, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoölogy, Ann Arbor, Mich.).

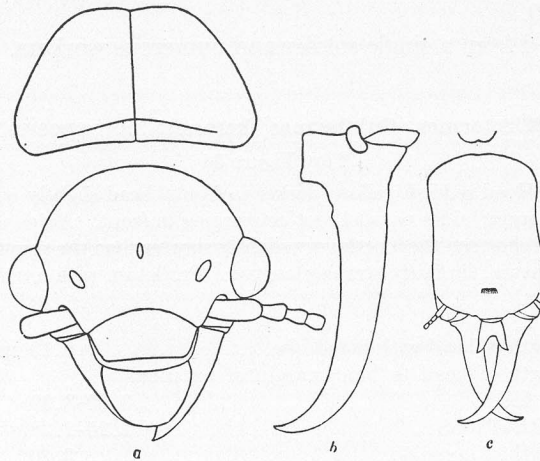
The description is based upon several soldiers.

I take pleasure in naming this species in honor of Dr. N. Kemner, who has done such valuable work on oriental termites and termitophiles.

Mirotermes (Cubitermes) subarquatus Sjöstedt

Plate XXIX; Text Figure 55

IMAGO.—Head black, not dotted with light spots except slightly on the postclypeus; fontanelle oval, somewhat depressed. Antennæ broken, the third segment a little shorter than the fourth, the fourth shorter than the second, the first nearly as long as the second, third and fourth together. Ocelli .16 mm. long and .16 mm. from the eyes. Postclypeus the same color as the head, no median line visible. Pronotum same as in *M. loubetsiensis*. Both posterior margins of the meso- and metanota deeply emarginate, the mesonotum cut a little wider and deeper than the metanotum. Incision equals a right angle in both cases. Abdominal tergites 2.60 mm. wide.

Fig. 55. *Mirotermes (Cubitermes) subarquatus* Sjöstedt.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

Length of head to tip of labrum.....	1.67 mm.
Width of head.....	1.71
Diameter of eye.....	0.43
Length of pronotum.....	0.89
Width of pronotum.....	1.60
Length of hind tibia.....	2.10
Length of left mandible.....	0.78
Length of queen.....	30.00
Width of abdomen of queen.....	6.50

I can detect no difference to distinguish this species from *M. loubetsiensis* in the imago caste unless it be the slightly larger size and the ocelli more removed from the eyes. The ocelli are conspicuously nearer the eyes than their own length in *M. zenkeri*. The fontanelle is large and circular in *M. sulcifrons*.

SOLDIER.—Head dark reddish brown in front and lighter behind. Head strongly constricted near the hind margin. Antennæ with 15 segments, the third smaller than the fourth, the fourth smaller than the second. Labrum similar to *M. loubetsiensis*. Mandibles similar in shape to those of *M. loubetsiensis* but shorter; rather strongly curved and black. Pronotum with a conspicuous emargination on the anterior margin.

Total length.....	10.00–10.50 mm.
Length of head with mandibles.....	5.57
Length of head to tip of labrum.....	4.10
Width of head.....	2.35–2.45
Length of antennæ.....	3.20
Length of pronotum.....	0.58
Width of pronotum.....	1.40
Length of hind tibia.....	1.93
Length of left mandible.....	2.55–2.60
Curvature of left mandible.....	0.37

Both the imago and soldier agree perfectly with the cotypes. Larger than *M. loubetsiensis*. The mandibles are more curved in *M. intercalatus*. The pronotum of *M. kemneri* is not emarginate in front and the mandibles are only slightly curved. *M. finitimus* is very close but is lighter in color and the labrum is not as deeply cut. *M. sulcifrons* is very close but the head is slightly shorter and is decidedly more arched.

Locality.—Lubila River (1° N., 27° 10' E.), Belgian Congo: Lang-Chapin Ccl., Sept. 20, 1919.

The description is based upon one queen and numerous soldiers.

These termites build rather remarkable nests on the side of trees (Plate XXIX). These nests show the caps, probably for shedding rain, which are found on other nests of *Cubitermes* (Plates XXX and XXXI). In the case of *M. subarquatus*, however, there are many more caps than are found in the other species and the nests are attached to the side of trees. The photograph of the nest taken in Medje (Plate XXIX, fig. 3) is probably this same species, but I have not found any specimens taken from that nest in the collections.

***Mirotermes (Cubitermes) heghi* Sjöstedt**

Text Figure 56

IMAGO.—Head blackish, oval; fontanelle large. The third and fourth segments of the antennæ about equal, the second longer. Eyes of medium size, not particularly prominent. Ocelli .17 mm. long, oval, .172 from the eyes. Postclypeus the same color as the head, median line barely visible. Pronotum same color as the head. Posterior margin of the mesonotum widely emarginate, the emargination much greater than a right angle. Posterior margin of the metanotum with a very small emargination.

Length without wings (king).....	10.00 mm.
Length of head.....	2.05
Width of head.....	1.78
Diameter of eye.....	0.45
Length of pronotum.....	1.09
Width of pronotum.....	1.67
Length of hind tibia.....	2.27
Length of left mandible.....	0.89

Close to *M. intercalatus* but the posterior margin of the pronotum in *M. intercalatus* is deeply emarginate. The fontanelle seems to be similar. Very close to *M. sulcifrons* but the postclypeus and pronotum seem to be

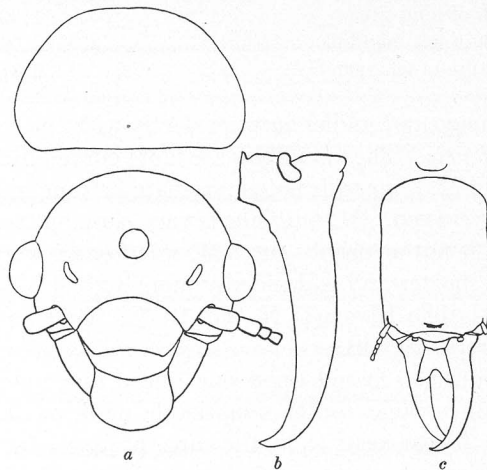


Fig. 56. *Mirotermes (Cubitermes) heghi* Sjöstedt.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

different in proportional measurements. *M. zenkeri* differs in the pronotum and fontanelle. *M. bulbifrons* and *M. speciosus* have a smaller fontanelle.

SOLDIER.—Head reddish yellow, front darker; sides parallel, only slightly constricted near the posterior margin. Head elevated in profile above the fontanelle. Antennæ with 15 segments, the third the smallest, the second and fourth about equal. Mandibles fairly straight except at the tips which are fairly strongly curved. Anterior margin of the pronotum not emarginate.

Length of head with mandibles.....	5.78 mm.
Length of head to the hind margin of the antennæ.....	3.00–3.20
Width of head.....	2.35

Length of antennæ.....	3.00 mm.
Length of pronotum.....	0.67
Width of pronotum.....	1.50
Length of hind tibia.....	1.93
Length of left mandible.....	2.44
Curvature of left mandible.....	0.33

M. domifaber is smaller. *M. intercalatus* is larger and the head is narrowed in front. *M. antennalis* is larger. Close to *M. sulcifrons* but differs in the anterior margin of the pronotum being without an emargination and the mandibles are proportionately shorter and stouter. *M. finitimus* has a proportionately shorter head. *M. bulbifrons* and *M. speciosus* are close but the imago are very different.

Locality.—Bipindi, Cameroon: Nos. 22, 54 and 59, G. Zenker Coll., 1920.

The descriptions are based upon a single king and numerous soldiers.

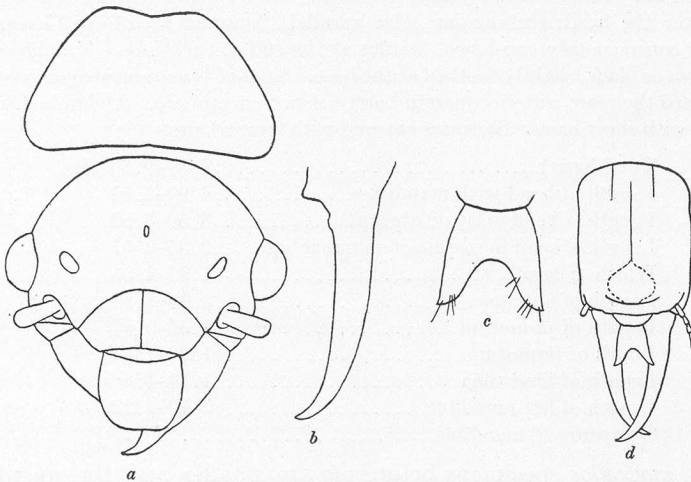


Fig. 57. *Mirotermes (Cubitermes) antennalis* Sjöstedt.

a, head and pronotum of imago from above; b, left mandible of soldier; c, labrum of soldier; d, head and front margin of pronotum of soldier from above.

***Mirotermes (Cubitermes) antennalis* Sjöstedt**

Plate XXXIII, Fig. 1; Text Figure 57

IMAGO.—Head dark blackish brown; covered with short hair and numerous longer bristles except near the posterior margin. Fontanelle a small dot. Antennæ with 16 segments, the first as long as the second and third, the third shorter than the fourth, the fourth shorter than the second. Eyes of medium size. Ocelli fairly large, .16 mm. long, a little less than their width from the eyes (.12 mm.). Labrum tongue-

shaped, .33 mm. long. Postclypeus the same color as the head or slightly lighter, .38 mm. long and .71 mm. wide. Pronotum same color as the head; anterior margin nearly straight; posterior margin emarginate. Abdominal tergites 2.56 mm. wide.

Length with wings.....	18.00-19.00 mm.
Length without wings.....	9.00-10.00
Length of head to tip of labrum.....	1.67- 1.70
Width of head.....	1.65
Length of antennæ.....	2.78
Diameter of eye.....	0.42
Length of pronotum.....	0.90-0.91
Width of pronotum.....	1.55
Length of hind tibia.....	2.10- 2.15
Length of anterior wing.....	15.80-16.00
Width of anterior wing.....	4.07

M. fungifaber and *M. finitimus* are smaller. Specimens agree with cotypes.

SOLDIER.—Head reddish yellow-brown to yellow; a few bristles sparsely scattered over the head; rectangular, sides parallel. Antennæ with 14 or 15 segments. Labrum conspicuously two-lobed, bristles at the end of each lobe. Mandibles dark red-brown or black, slightly toothed at the base. Sides of pronotum strongly converging toward the rear; anterior margin barely or not emarginate. Abdominal tergites covered with short hairs. Sternites covered with longer hairs.

Total length.....	7.50-9.50 mm.
Length of head with mandibles.....	4.90-5.15
Length of head to tip of labrum.....	3.50-3.80
Length of head to margin of antennal base....	2.35-2.57
Width of head.....	1.95-2.35
Length of antennæ.....	2.60-2.80
Length of pronotum.....	0.55-0.57
Width of pronotum.....	1.27-1.44
Length of hind tibia.....	1.70-1.86
Length of left mandible.....	2.10-2.22
Curvature of mandible.....	0.27

M. modestior specimens before me are smaller and the mandibles are a little more curved. *M. pallidiceps* is smaller and the mandibles are more curved. The mandibles of *M. domifaber* are as long as the head to the front margin of the base of the antennæ. *M. fungifaber* is smaller. *M. finitimus* has a proportionately longer head and the mandibles are a little more curved. *M. bilobatodes* is smaller with more strongly curved mandibles. *M. kemneri* is larger. *M. subcrenulatus* has a more narrowed head in front and the mandibles are more curved. Specimens agree with cotypes.

WORKER.—Antennæ with 15 segments, the third smallest, basal segment as long as the three following together. Width of head, 1.38 mm.

Locality.—Garamba, Belgian Congo: No. 371, Lang-Chapin Coll., March 19, 1912; No. 982, Lang-Chapin Coll., March 19, 1912.

The descriptions are based upon several winged imagos and many soldiers and workers.

***Mirotermes (Cubitermes) loubetsiensis* Sjöstedt**

Plate XXX; Text Figures 58

IMAGO.—Head dark brown, speckled conspicuously with light spots; fontanelle oval. The third and fourth segments of the antennæ nearly equal. Ocelli .16 mm. long and .11 mm. from the eyes. Postclypeus a little lighter than the head.

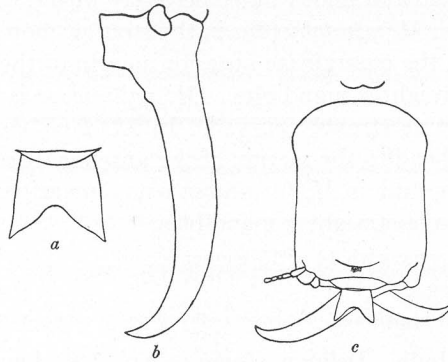


Fig. 58. *Mirotermes (Cubitermes) loubetsiensis* Sjöstedt.

a, labrum of soldier; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

Length of head.....	1.71 mm.
Width of head.....	1.60
Diameter of eye.....	0.41
Length of pronotum.....	0.89
Width of pronotum.....	1.50
Length of hind tibia.....	2.10
Length of queen.....	23.00
Width of abdomen of queen.....	4.00

I am unable to find a good character which will distinguish the imago of this species from that of *M. antennalis*.

SOLDIER.—Head reddish yellow-brown, darker in front; sides parallel, a slight depression in the side near the posterior margin; a few bristles scattered over the head. Antennæ with 15 segments, the third a little shorter than the fourth, the fourth a little shorter than the second, the first as long as the second, third and fourth together. Labrum forked, the tips strongly pointed, .55 mm. long. Mandibles stronger and more curved than in *M. antennalis*. Pronotum with a conspicuously emarginate anterior margin.

Total length.....	7.50-8.50 mm.
Length of head with mandibles.....	4.70-5.10
Length of head to tip of labrum.....	3.85
Length of head to margin of antennal base.....	2.57
Width of head.....	2.10-2.27
Length of antennæ.....	3.00
Length of pronotum.....	0.58
Width of pronotum.....	1.33
Length of hind tibia.....	1.80
Length of left mandible.....	2.10
Curvature of mandible.....	0.31

Both the imago and soldier agree perfectly with the cotypes. Easily distinguished from *M. minitabundus* in the stouter, more strongly curved mandibles and in the emarginate anterior margin of the pronotum. *M. antennalis* has straighter mandibles. *M. pallidiceps* is smaller and the mandibles are not as strongly curved. In *M. domifaber* the mandibles are as long as the head to the margin of the antennæ bases. The anterior margin of the pronotum in *M. fungifaber* is not emarginate. *M. finitimus* and *M. zenkeri* have straighter mandibles.

WORKER.—Antennæ with 14 or 15 segments.

Width of head.....	1.33 mm.
Length of hind tibia.....	1.33

Locality.—Medje, Belgian Congo: No. 740, Lang-Chapin Coll., June, 1914.

The species is described from one queen, numerous soldiers and many workers.

This termite was taken from a mushroom-shaped nest (Plate XXX) which Mr. Lang states is common in the forest. "The queen was found 4 inches from the ground and the nest was 44 cm. high, 27 cm. in diameter at the top and 13 cm. wide across the middle" (Lang, field notes).

Mirotermes (Cubitermes) gaigei, new species

Text Figure 59

SOLDIER.—Head reddish yellow, darker in front; sides parallel, not converging in front; only a slight constriction near the posterior margin. Antennæ with 15 segments, the third smallest, the fourth a little shorter than the second. Labrum typical. Mandibles fairly strongly curved. Pronotum with a somewhat emarginate anterior margin.

Length of head with mandibles.....	5.14 mm.
Length of head to hind margin of antennal bases.....	2.65-2.78
Width of head.....	2.14

Length of antennæ.....	3.00 mm.
Length of pronotum.....	0.61-0.65
Width of pronotum.....	1.33
Length of hind tibia.....	1.73-1.78
Length of left mandible.....	2.10-2.15
Curvature of left mandible.....	0.45

Very close to *M. loubetsiensis* but the labrum is cut more deeply and the pronotum is not as deeply emarginate. *M. fungifaber* is a little smaller. The pronotum of *M. finitimus* is not so deeply emarginate and the mandibles are straighter. The mandibles are straighter in *M. antennalis*. The mandibles are as long as the length of the head to the front margin of the base of the antennæ in *M. domifaber*. The labrum of *M. intercalatus* is more deeply emarginate. Mandibles stouter and gula conspicuously more constricted in *M. planifrons*. Gula wider and shorter than in *M. fungifaber*, var. *elongata*.

WORKER.—Antennæ with 15 segments, the third very small, just dividing from the fourth.

Width of head.....1.22 mm.

Length of hind tibia.....1.33

Type Locality.—Bipindi, Cameroon: Nos. 45 and 17, G. Zenker Coll., 1920.

Holotype.—Soldier, No. 45 (Mus. Zoölogy, Ann Arbor, Mich.).

The description is based upon numerous soldiers and workers. I have named the species in honor of Dr. F. M. Gaige, through whose courtesy I was allowed to study the Cameroon collections included in this report.

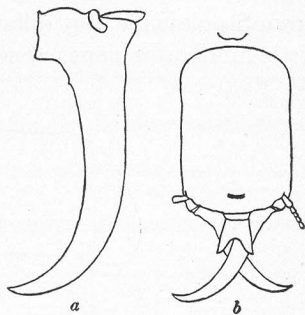


Fig. 59. *Mirotermes* (*Cubitermes*) *gaigei*, new species.

a, left mandible of soldier; b, head and front margin of pronotum of soldier from above.

***Mirotermes* (*Cubitermes*) *fungifaber* (Sjöstedt)**

Text Figure 60

IMAGO.—Head blackish, oval; with numerous long bristles and many shorter hairs. Fontanelle indistinct. The third segment of the antennæ shorter than the fourth, the fourth shorter than the fifth or second. Eyes large and prominent. Ocelli .195 mm. long, large, oval, facing sideways, .11 mm. from the eye. Postclypeus nearly as dark as the head, median line very indistinct. Pronotum about the same color as the head, the posterior margin only slightly concave. Angle formed by the emargination of the posterior margins of the meso- and metanota greater than a right angle.

Length of head.....	1.83 mm.
Width of head.....	1.77
Diameter of eye.....	0.53
Length of pronotum.....	0.90
Width of pronotum.....	1.50
Length of left mandible.....	0.78

The eye is smaller and the ocelli are farther away from the eyes in *M. bilobatodes*. The eyes and the ocelli are smaller in *M. subcrenulatus*. Agrees closely with the queens determined by Schmitz as *M. finitimus* from Stanleyville, but differs in being a little darker and the ocelli are a little more prominent, standing above the level of the head more than in *M. finitimus*.

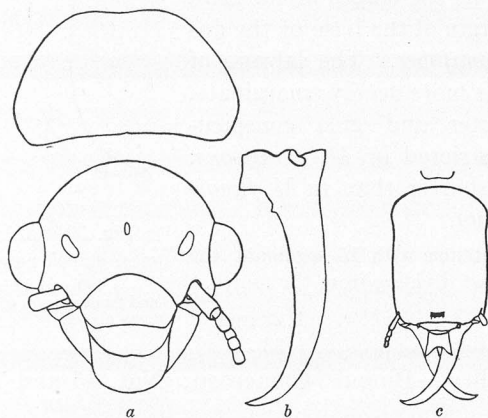


Fig. 60. *Mirotermes (Cubitermes) fungifaber* (Sjöstedt).

a, head and pronotum of imago from above; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

SOLDIER.—Head brownish yellow, slightly darker in front; sides parallel with a weak depression near the hind margin; head not perceptibly narrowed in front. Antennæ with 15 segments, third smallest, fourth shorter than the second. Mandibles fairly strongly curved. Anterior margin of the pronotum very slightly emarginate.

Length of head with mandibles.....	4.65–4.87 mm.
Length of head to hind margin of antennal bases.....	2.45–2.57
Width of head.....	1.90–2.10
Length of antennæ.....	2.57–2.78
Length of pronotum.....	0.55–0.60
Width of pronotum.....	1.13–1.16
Length of hind tibia.....	1.55–1.78
Length of left mandible.....	2.10–2.11
Curvature of left mandible.....	0.33–0.37

Soldiers a little smaller than specimens of *M. finitimus* determined by Schmitz from Stanleyville and the anterior margin of the pronotum not quite as emarginate. *M. bilobatodes* is smaller and the head is narrowed in front and the sides without a depression near the posterior margin. The head is narrowed in front in *M. pallidiceps*. The mandibles are straighter in *M. antennalis*. The head is narrowed in front in *M. subcrenulatus*.

WORKER.—Antennæ with 14–15 segments.

Width of head.....1.22 mm.

Length of hind tibia.....1.27

Locality.—Bipindi, Cameroon: No. 27, G. Zenker Coll., 1920.

The descriptions are based upon one queen, several soldiers and numerous workers.

***Mirotermes (Cubitermes) congoensis*, new species**

Text Figure 61

SOLDIER.—Head reddish yellow, not conspicuously darker in front; sides nearly straight and without much of a depression near the hind margin; front of head slightly narrowed. Third segment of the antennæ longer than the second, the second slightly longer than the fourth, the third sometimes dividing. Labrum deeply cut. Mandibles fairly straight. Anterior margin of the pronotum slightly emarginate.

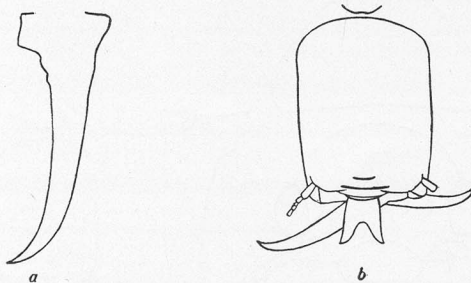


Fig. 61. *Mirotermes (Cubitermes) congoensis*, new species.

a, left mandible of soldier; b, head and front margin of pronotum of soldier from above.

Length of head with mandibles.....4.34–4.56 mm.

Length of head to tip of labrum.....3.43

Length of head to margin of antennal bases.....2.14

Width of head.....1.89–1.93

Length of pronotum.....0.50

Width of pronotum.....1.11

Length of hind tibia.....1.55–1.67

Length of left mandible.....1.92–2.00

Curvature of left mandible.....0.20

M. antennalis larger. Gula more constricted in *M. modestior*. *M. bilobatodes* is slightly smaller and the mandibles are more curved. The mandibles are more curved in *M. subcrenulatus*. The mandibles in *M. pallidiceps* are equal in length to the head from the anterior margin of the base of the antennæ. The mandibles also seem to be a little more curved and the labrum more widely forked.

WORKER.—

Width of head.....1.05 mm.
Length of hind tibia.....1.10

Type Locality.—Banana, Belgian Congo: Lang-Chapin Coll., Aug., 1915.

Holotype.—Soldier (A. M. N. H.).

Description based upon several soldiers and workers.

***Mirotermes (Cubitermes) schmidti*, new species**

Text Figure 62

IMAGO.—Head blackish. Fontanelle a small depressed spot. Third segment of the antennæ shorter than the fourth, the fourth shorter than the second. Eyes of

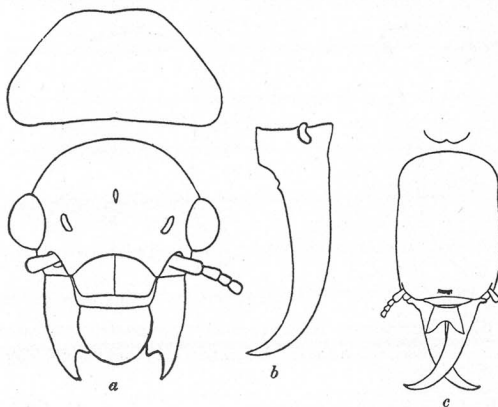


Fig. 62. *Mirotermes (Cubitermes) schmidti*, new species.

a, head and pronotum of imago from above; *b*, left mandible of soldier; *c*, head and front margin of pronotum of soldier from above.

medium size, prominent. Ocelli facing sideways, .15 mm. long and .13 mm. from the eyes. Postclypeus same color as the head, median line barely visible. Posterior margins of the meso- and metanota deeply emarginate, the cut of the mesonotum forming a right angle and the cut of the metanotum not quite forming a right angle.

Length of head.....	1.67 mm.
Width of head.....	1.50
Diameter of eye.....	0.39
Length of pronotum.....	0.78
Width of pronotum.....	1.44
Length of left mandible.....	0.78
Length of queen.....	22.00
Width of abdomen of queen.....	4.00

M. duplex is smaller. *M. weissi* is close but smaller.

SOLDIER.—Head reddish yellow-brown; rectangular; sides very slightly constricted near the posterior margin; head not narrowed in front and somewhat darker in color in front. Antennæ with 15 segments, the third shorter than the fourth, the fourth shorter than the second. Mandibles fairly strongly curved. Labrum typical. Anterior margin of the pronotum conspicuously emarginate.

Length of head with mandibles.....	4.28 mm.
Length of head to hind margin of antennal bases.....	2.20–2.35
Width of head.....	1.82
Length of antennæ.....	2.57
Length of pronotum.....	0.54
Width of pronotum.....	1.10
Length of hind tibia.....	1.44
Length of left mandible.....	1.89
Curvature of left mandible.....	0.30

M. fungifaber has longer mandibles and the base of the mandibles have a different shape. *M. duplex* is smaller. The head is narrowed in front in *M. weissi* and *M. schmidtii* is larger. *M. bilobatodes* has the head narrowed in front. *M. finitimus* has longer mandibles. *M. subcrenulatus* and *M. pallidiceps* have longer mandibles and the heads are narrowed in front. *M. severus* is larger.

WORKER.—Antennæ with 14–15 segments.

Width of head.....	1.07 mm.
Length of hind tibia.....	1.15

Type Locality.—Bipindi, Cameroon: No. 44, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoölogy, Ann Arbor, Mich.).

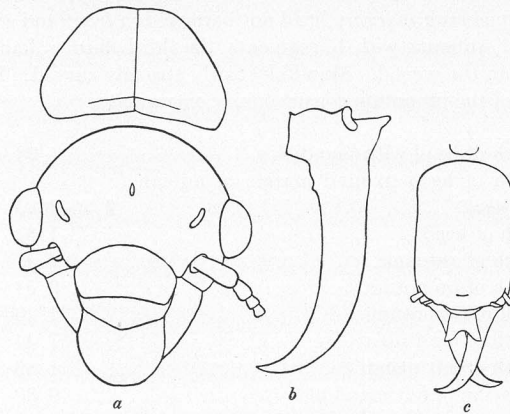
Morphotype.—Queen (Mus. Zoölogy, Ann Arbor, Mich.).

This species is described from a queen, several soldiers, and many workers. I have named the species in honor of Mr. Karl P. Schmidt, to whom I owe my first introduction to termites.

Mirotermes (Cubitermes) banksi, new species

Text Figure 63

IMAGO.—Head black, covered on top with long bristles and short hairs. The third and fourth segments of the antennæ short and about equal, the second not quite as long as the third and fourth together and slightly longer than the fifth. Eyes of medium size. Ocelli .17 mm. long, oval, facing sideways, .074 mm. from the eyes. Postclypeus same color as the head, median line absent. Pronotum same color as the head. Posterior margins of the meso- and metanota emarginate, the angle thus formed equal to more than a right angle in the mesonotum and less than a right angle in the metanotum. Wings smoky.

Fig. 63. *Mirotermes (Cubitermes) banksi*, new species.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

Length with wings.....	15.00 mm.
Length without wings.....	8.00
Length of head.....	1.60
Width of head.....	1.44
Diameter of eye.....	0.37
Length of pronotum.....	0.72
Width of pronotum.....	1.24
Length of hind tibia.....	1.55
Length of left mandible.....	0.78
Length of anterior wing.....	12.00
Width of anterior wing.....	3.07

M. finitimus is a little larger. The postclypeus of *M. fungifaber* has a median line. The ocelli are farther from the eyes in *M. bilobatodes* and *M. zuluensis*. *M. weissii* is smaller.

SOLDIER.—Head reddish yellow, darker in front; sides parallel, slightly constricted near the posterior margin. Antennæ with 15 segments, the third shorter than

the fourth, the fourth shorter than the second. Mandibles rather strongly curved and stout. Anterior margin of the pronotum very slightly if at all emarginate.

Length of head with mandibles.....	4.50 mm.
Length of head to hind margin of antennal bases...	2.35
Width of head.....	1.85
Length of antennæ.....	2.35
Length of pronotum.....	0.55
Width of pronotum.....	1.10
Length of hind tibia.....	1.38
Length of left mandible.....	1.80
Curvature of left mandible.....	0.30

M. finitimus, *M. fungifaber*, *M. bilobatodes*, *M. subcrenulatus*, *M. severus*, and *M. pallidiceps* with longer mandibles. *M. bilobatodes*, *M. subcrenulatus*, *M. pallidiceps*, *M. breviceps*, *M. schereri*, and *M. weissii* with the head narrowed in front. The mandibles are straighter in *M. severus*. *M. breviceps*, *M. duplex*, *M. schereri*, and *M. weissii* smaller. The anterior margin of the pronotum is emarginate in *M. schmidtii*.

WORKER.—Antennæ with 14–15 segments.

Width of head.....	1.00 mm.
Length of hind tibia.....	1.05

Type Locality.—Bipindi, Cameroon: Nos. 4, 15 and 71, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoölogy, Ann Arbor, Mich.).

Morphotype.—Winged imago (Mus. Zoölogy, Ann Arbor, Mich.).

I am also referring No. 28, Anna Lehman Coll. from Lolodorf, Cameroon, to this species with little doubt, although the soldier is slightly lighter and the front margin of the pronotum is more rounded.

The species is described from a single winged imago (No. 4 Zenker Coll.) and numerous soldiers and workers from the other vials mentioned above, together with No. 4.

I have named the species in honor of Dr. Nathan Banks, the authority on the termites of the United States and the Neotropical region.

***Mirotermes (Cubitermes) comstocki*, new species**

Text Figure 64

IMAGO.—Head dark brown. Fontanelle a dot in the middle of the head. Third segment of the antennæ about equal to the fourth, second longer than the third. Eyes of medium size, prominent. Ocelli .15 mm. long, facing sideways, .10 mm. from the eyes. Labrum tongue-shaped. Postclypeus slightly lighter than the head, median line faint, .67 mm. wide and .334 mm. long. Posterior margin of pronotum emarginate, angles rounded; anterior angles rather sharp and somewhat depressed; sides nearly straight. Posterior margin of metanotum as deeply cut but not as wide as the posterior margin of the mesonotum. Abdominal tergites 2.14 mm. wide.

Length of head.....	1.78 mm.
Width of head.....	1.50
Diameter of eye.....	0.38
Length of pronotum.....	0.78
Width of pronotum.....	1.33
Length of hind tibia.....	1.55
Length of left mandible.....	0.78
Length of queen.....	15.00
Width of abdomen of queen.....	3.00

SOLDIER.—Head yellowish; proportionately long and narrow; sides straight, no conspicuous depression on the sides near the back; forehead sloping at an angle of

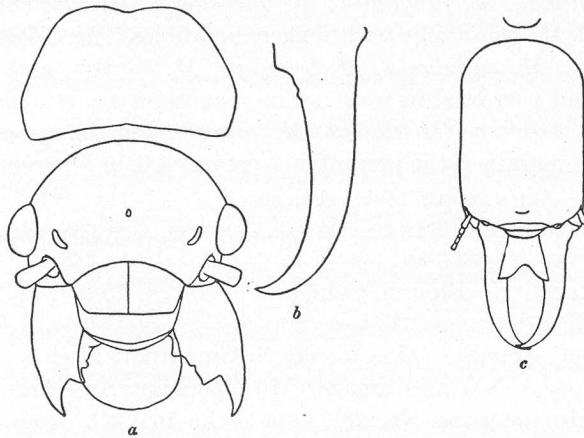


Fig. 64. *Mirotermes (Cubitermes) comstocki*, new species.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head and front margin of pronotum of soldier from above.

about 60°. A few bristles scattered over the head. Antennæ with 15 segments, the third smallest. Labrum typical, with sharp points and deeply forked. Mandibles proportionately strongly curved. Anterior margin of pronotum not or very slightly emarginate.

Length of head with mandibles.....	4.00–4.10 mm.
Length of head to tip of labrum.....	3.13
Width of head.....	1.84–1.90
Length of antennæ.....	2.25–2.30
Length of pronotum.....	0.50–0.52
Width of pronotum.....	1.00–1.11
Length of hind tibia.....	1.25–1.30
Length of left mandible.....	1.71
Curvature of mandible.....	0.30

The head is narrower in front in *M. bilobatodes*. *M. duplex* is smaller and the pronotum is cut in the middle. The mandibles are longer and the

head is narrowed in front in *M. pallidiceps*. *M. weissi* has a shorter head which is narrowed in front. The head of *M. schereri* is proportionately short compared to the mandibles. *M. fungifaber* is larger. *M. finitimus* has a larger head and longer mandibles.

WORKER.—Antennæ with 14 segments, the third dividing. Width of head, 1.05 mm.

Type Locality.—Bipindi, Cameroon: No. 12, G. Zenker Coll., 1920.

Holotype.—Soldier (Mus. Zoölogy, Ann Arbor, Mich.).

Morphotype.—Queen (Mus. Zoölogy, Ann Arbor, Mich.).

The descriptions are based upon one young queen, several soldiers and numerous workers. I have named the species in honor of Prof. J. H. Comstock, to whom I owe a great deal of my enthusiasm for the study of insects.

***Mirotermes (Cubitermes) orthognathus*, new species**

Plate XXXI, Fig. 2; Text Figure 65

SOLDIER.—Head reddish yellow; sides fairly straight, somewhat converging in front. Antennæ with 15 segments, the third a little shorter than the fourth, the fourth

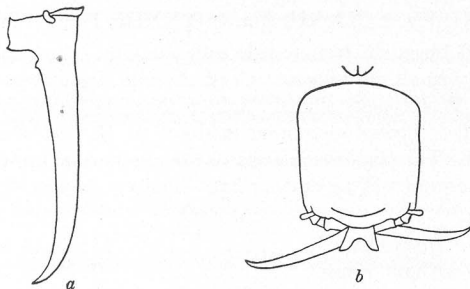


Fig. 65. *Mirotermes (Cubitermes) orthognathus*, new species.

a, left mandible of soldier; b, head and front margin of pronotum of soldier from above.

about equal to the second. Mandibles very straight and with only the tips curved. Anterior margin of the pronotum emarginate.

Length of head with mandibles.....	3.79 mm.
Length of head to the hind margin of antennal bases.....	1.78
Width of head.....	1.67
Length of antennæ.....	2.33
Length of pronotum.....	0.44
Width of pronotum.....	0.89
Length of hind tibia.....	1.27
Length of left mandible.....	1.95
Curvature of left mandible.....	0.24

The mandibles are more curved in *M. bisulcatus* and in *M. sankurensis*. In *M. minitabundus* the mandibles are shorter than the head.

WORKER.—Antennæ with 15 segments.

Width of head.....1.11 mm.

Length of hind tibia.....1.11

Type Locality.—Faradje, Belgian Congo: No. 316, Lang-Chapin Coll.

Holotype.—Soldier (A. M. N. H.).

Other Localities.—Faradje, Belgian Congo: No. 316, Lang-Chapin Coll., Jan. 1912; No. 335, Lang-Chapin Coll., February, 1912. Near Yakuluku, Belgian Congo: Nos. 302 and 303, Lang-Chapin Coll., December, 1911.

Described from numerous soldiers and workers.

Mr. Lang states in his field notes with regard to Nos. 316 and 303 that the termites were taken "from a mushroom-shaped termite structure" (Plate XXXI, fig. 2). *Ancistrotermes crucifer*, *Nasutitermes suffusus* and *Mirotermes* (*Euchilotermes*) *quadriceps* were also found in vial No. 302.

***Mirotermes* (*Cubitermes*) *sankurensis* (Wasmann)**

Plates XXXI, Fig. 1; XXXII, Fig. 1; XXXIII, Fig. 1; Text Figure 66

IMAGO.—Head blackish, rather wide and circular. Antennæ with 16-17 segments. Eyes fairly small, prominent. Ocelli .11 mm. from the eyes, .15 mm. long, facing sideways. Postclypeus slightly lighter than the head with a narrow light streak in the middle. Pronotum similar in shape to *M. minitabundus*. Same color as the postclypeus. The posterior margin of the mesonotum more widely and deeply cut than the metanotum. Wings rather light cloudy yellowish brown. Media with 10 branches.

Length with wings.....14.50-15.00 mm.

Length without wings.....7.70-8.20

Length of head to tip of labrum.....1.27

Length of antennæ.....2.20

Diameter of eye.....0.32

Length of pronotum.....0.73

Width of pronotum.....1.10

Length of anterior wing.....12.43

Width of anterior wing.....3.20

Length of queen.....25.00

Width of abdomen of queen.....5.50

M. bilobatus has 15 segments in the antennæ. *M. curvatus* has a proportionately longer head and is smaller.

The imago from Matadi has 17 segments in the antennæ and the imago from St. Antonio has 16 segments. No other difference can be found.

SOLDIER.—Head yellowish, not conspicuously darker in front; front somewhat narrowed and a slight constriction near the posterior margin; a few bristles scattered over the head. Antennæ with 14–15 segments. Labrum deeply forked. Mandibles not strongly curved except near the tip. Anterior margin of the pronotum very slightly emarginate.

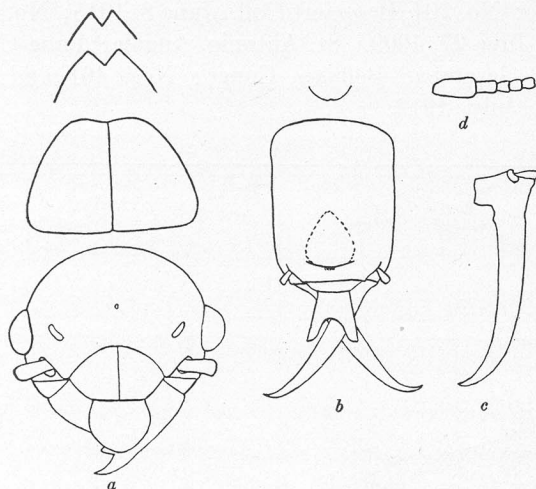


Fig. 66. *Mirotermes (Cubitermes) sankurensis* (Wasmann).

a, head, pronotum and hind margins of meso- and metanota of imago from above; b, head and front margin of pronotum of soldier from above; c, left mandible of soldier; d, basal segments of a soldier antenna containing 15 segments.

Length of head with mandibles.....	3.20–3.30 mm.
Length of head to tip of labrum.....	2.35
Width of head.....	1.35–1.54
Length of antennæ.....	2.00–2.27
Length of pronotum.....	0.38–0.44
Width of pronotum.....	0.78–0.80
Length of hind tibia.....	1.10–1.22
Length of left mandible.....	1.67–1.78
Curvature of left mandible.....	0.23

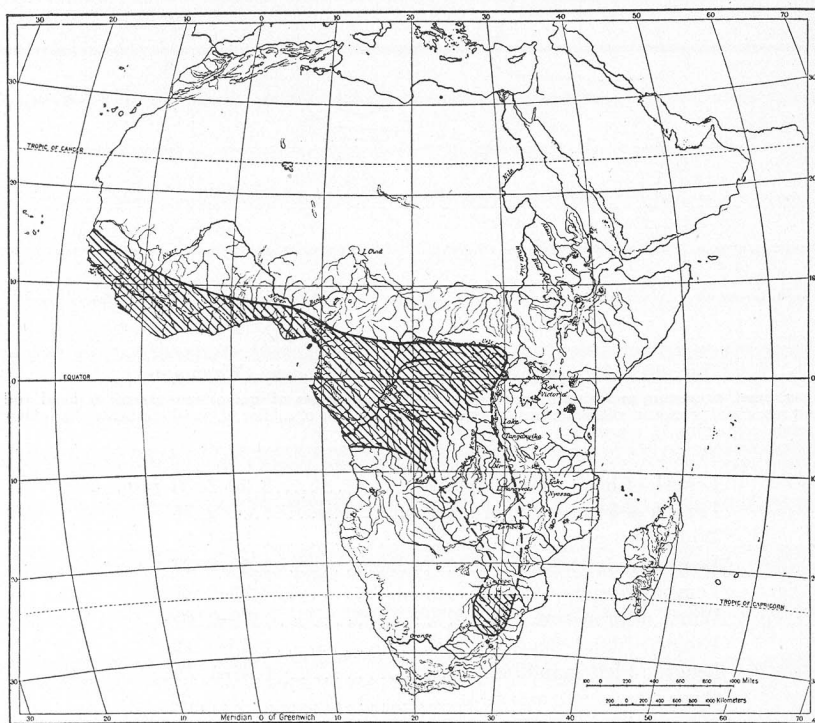
Mandibles of *M. bilobatus* shorter. Head of *M. tenuiceps* longer with the mandibles. *M. muneris* has a longer head and the pronotum is not emarginate in front. *M. cubicephalus* has a shorter head and the anterior margin of the pronotum is not emarginate. *M. glebæ* is larger. *M. curtatus* has more strongly curved mandibles and the head is proportionately longer. The labrum of *M. pretorianus* is different and in general *M. sankurensis* is larger. I can detect no differences of specific value between cotypes of *M. sankurensis* and *M. sibiensis* and I am therefore placing *M. sibiensis* in synonymy with *M. sankurensis*.

WORKER.—Antennæ with 14–15 segments.

Width of head.....0.89 mm.

Length of hind tibia.....0.92

Localities.—Thysville, Belgian Congo: No. 191, Bequaert Coll., June 3, 1915; No. A.4542, Lang-Chapin Coll., June 4, 1915. Matadi, Belgian Congo: No. 204, Bequaert Coll., June 8, 1915; No. 1005, Lang-Chapin Coll., June 27, 1909. St. Antonio, Angola: Lang-Chapin Coll., Aug., 1915. Garamba, Belgian Congo: Nos. 461 and 462, Lang-Chapin Coll., July, 1912.



Map 19. Distribution of the subgenus *Procubitermes*.

The descriptions are based upon numerous imagos from Matadi (No. 204, Bequaert Coll.) and St. Antonio, a single queen from St. Antonio and many soldiers and workers from all the above localities.

The field notes taken by Dr. Bequaert and Mr. Lang follow: "from a mushroom-shaped clay nest, in the dry, rocky savannah" (Bequaert, No.

191); "Termites from a mushroom-shaped termite structure" (Lang, No. A.4542); "from a dome-shaped, very solid, dark gray clay nest in the rocky, dry savannah country" (Bequaert, No. 204); "from a mushroom-shaped nest" (Lang, No. 1005, Plate XXXI, fig. 1); "termites from a cone-shaped structure without a hat" (Lang, St. Antonio); "from a termite structure one foot high" (Plate XXXIII, fig. 1, Lang, Nos. 461, 462).

Subgenus **PROCUBITERMES** Silvestri

Not enough localities are known to be able to plot the distribution of this subgenus accurately (Map 19). Ultimately it may be found to be distributed much the same as the subgenus *Cubitermes* which it closely resembles in many particulars. Fuller (1925b) records *M. mtwalumi* from 30° 20' South on the east coast of Natal and also tentatively assigns two Zululand species to this group. These localities extend the range shown in Map 19.

Of the three species in the collections before me which I am referring to this subgenus, two seem to be new.

Sjöstedt (1924a) has recently made *M. lamanianus* the type of a new genus, *Noditermes*. I am not convinced that the characters are distinct enough to warrant the erection of a new group and for the present I am referring this species to *Procubitermes*. For the same reason, I am also referring *M. bidentatus* (Silvestri) to *Procubitermes*, although this species is quite distinct and may warrant Sjöstedt's (1924a) separation to form the new genus *Unquitermes*. I also have been unable to recognize the separation of *Lepidoterme*s and for the present am including this group with *Procubitermes*.

Mirotermes jucundus (Sjöstedt) is undoubtedly distinct from *Procubitermes* and I believe Sjöstedt (1924a) is justified in erecting the new group *Fastigitermes* for its reception. For the present I am including *Fastigitermes* as a subgenus of *Mirotermes*.

Mirotermes (Procubitermes) niapuensis, new species

Plate XXXII, Fig. 2; Text Figure 67

IMAGO.—Head medium dark red-brown; fontanelle slit-shaped, light. Antennæ with 15 segments, the third very small, the second equal to the fourth. Eyes of medium size. Ocelli .14 mm. long, oval, facing sideways, 1.10 mm. from the eyes. Postclypeus slightly lighter than the head, with narrow dark median line. Pronotum a little lighter than the head, posterior margin rather deeply emarginate. Posterior margins of the meso- and metanota with small acute emarginations, the angle thus formed being less than a right angle.

Length of head.....	1.22 mm.
Width of head.....	1.19
Length of antennæ.....	1.78
Diameter of eye.....	0.31
Length of pronotum.....	0.59
Width of pronotum.....	1.05
Length of hind tibia.....	1.16
Length of queen.....	20.00
Width of abdomen of queen.....	3.50

SOLDIER.—Head yellowish; rectangular; sides fairly straight and parallel. Antennæ with 14 segments, the third longer than the second, the second equal to the

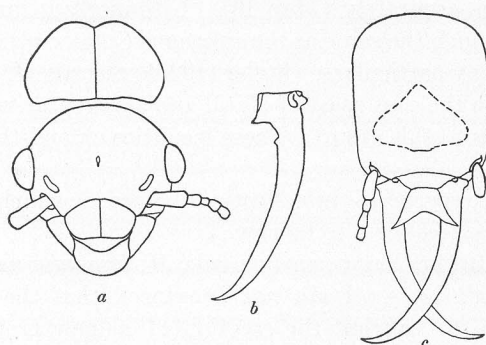


Fig. 67. *Mirotermes (Procubitermes) niapuensis*, new species.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head of soldier from above.

fourth. Labrum forked, the points not always as wide apart as in the figure. Mandibles somewhat elbowed instead of being evenly curved, a tooth near the base of each mandible. Gula with no sharp projection. Anterior margin of pronotum very weakly emarginate.

Length of head with mandibles.....	3.26 mm.
Width of head.....	1.37
Length of antennæ.....	2.20
Length of pronotum.....	0.31
Width of pronotum.....	0.70
Length of hind tibia.....	1.00
Length of left mandible.....	1.71

Very close to *M. curvatus* but the mandibles of *M. curvatus* are shorter and do not show the elbowing of those of *M. niapuensis*. *M. ueleensis* is close but the mandibles are only 1.53–1.56 mm. long.

WORKER.—Antennæ with 14 segments.

Width of head.....	0.94 mm.
Length of hind tibia.....	1.00

Type Locality.—Niapu, Belgian Congo: No. 681, Lang-Chapin Coll., November 5, 1913.

Holotype.—Soldier (A. M. N. H.).

Morphotype.—Queen (A. M. N. H.).

Described from one queen and numerous soldiers and workers from the type locality.

The nest of this species is a very remarkable structure which Mr. Lang describes as follows: "Nest built along the sides of trees, usually a foot or two from the ground. I have seen one start as high as eleven feet from the ground." Mr. Lang has also told me that he believes the peculiar slanting structures above the nest (Plate XXXII, fig. 2) are for the purpose of shedding the rain from the nest as it descends the trunk of the tree during showers. From my own observations on the ability of similar slanting constructions above the nest of *Nasutitermes* (*Constrictitermes*) *cavifrons* (Holmgren) in British Guiana, to shed rain, I believe that this surmise is correct. Plate XXXVI shows photographs of a similar nest which was certainly built by a species of this subgenus from which *Microcerotermes progrediens* Silvestri was taken. In this invaded nest which probably lacked the original builders, one can see that the slanting constructions are in disrepair.

One other termite, *Amitermes excellens* Silvestri, makes similar slanting structures on the sides of trees in British Guiana, but in this case the structures are hollow and the termites walk about in them. In those of *N. cavifrons* the structures are solid. I cannot say whether they are solid or hollow in the case of *M. niapuensis*, but from their size in the photographs I should judge them hollow.

***Mirotermes* (*Procubitermes*) *undulans* Schmitz**

Text Figure 68

IMAGO.—Head yellowish brown; oval; fontanelle small, white; three muscle insertions in front of the fontanelle. The third segment of the antennæ about twice as long as the second or fourth, showing signs of division. Eyes of medium size, close to the lower margin. Ocelli of medium size, more than their width from the eyes. Postclypeus lighter than the head, with a faint median line. Pronotum slightly lighter than the head, posterior margin emarginate. Posterior margins of the meso- and metanota very narrowly emarginate.

Length of head.....	1.23 mm.
Width of head.....	1.10
Diameter of eye.....	0.38
Length of pronotum.....	0.57
Width of pronotum.....	0.97
Length of hind tibia.....	1.03
Length of queen.....	19.00
Width of abdomen of queen.....	3.00

SOLDIER.—Head reddish yellow; rectangular; sides straight and parallel; gula without sharp projection. Antennæ with 14 segments, the second equal to the third, the fourth shorter than the third. Labrum deeply cut, each tip fairly sharp. Mandibles with a small tooth near the base of each; left mandible not evenly curved, but elbowed in two places; right mandible evenly curved. Anterior margin of the pronotum somewhat emarginate.

Length of head with mandibles.....	3.05 mm.
Width of head.....	1.10
Length of antennæ.....	2.00
Length of pronotum.....	0.26
Width of pronotum.....	0.67
Length of hind tibia.....	0.89
Length of left mandible.....	1.57

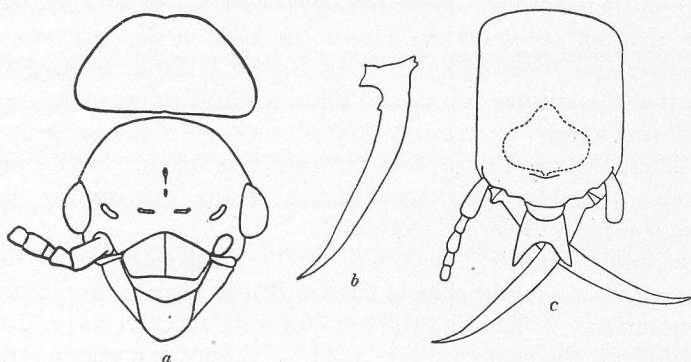


Fig. 68. *Mirotermes (Procubitermes) undulans* Schmitz.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head of soldier from above.

Smaller than *M. niapuensis* and the mandibles are a different shape. Agrees perfectly with specimens determined by Schmitz from Stanleyville.

WORKER.—Antennæ with 14 segments.

Width of head.....	0.86 mm.
Length of hind tibia.....	0.72

Localities.—Ngayu, Belgian Congo: No. 50, Lang-Chapin Coll., Dec. 19, 1909. Region of Stanleyville, Belgian Congo: No. 7R oben and No. 48 TZa, Kohl Coll.

Described from two queens from region of Stanleyville and numerous soldiers and workers from both localities. No. 48TZa was determined by Schmitz and is probably type material although not so marked.

Mirotermes (Procubitermes) wasmanni, new species

Text Figure 69

IMAGO.—Head dark reddish brown, finely speckled with light wherever a hair is placed; oval; fontanelle slit-shaped, light. Antennæ with 15 segments, the third a little shorter than the fourth, the fourth shorter than the second. Eyes of medium size, not very prominent. Ocelli .12 long, oval, .05 from the eyes. Postclypeus slightly lighter than the head, median line very faint. Pronotum same color as postclypeus, posterior margin emarginate. Posterior margins of the meso- and metanota emarginate; angles formed nearly equal to a right angle. Wings smoky, veins all conspicuous.

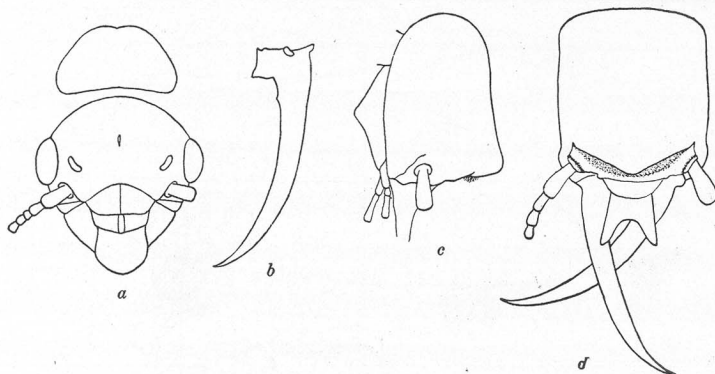


Fig. 69. *Mirotermes (Procubitermes) wasmanni*, new species.

a, head and pronotum of imago from above; b, left mandible of soldier; c, head of soldier from the side; d, head of soldier from above.

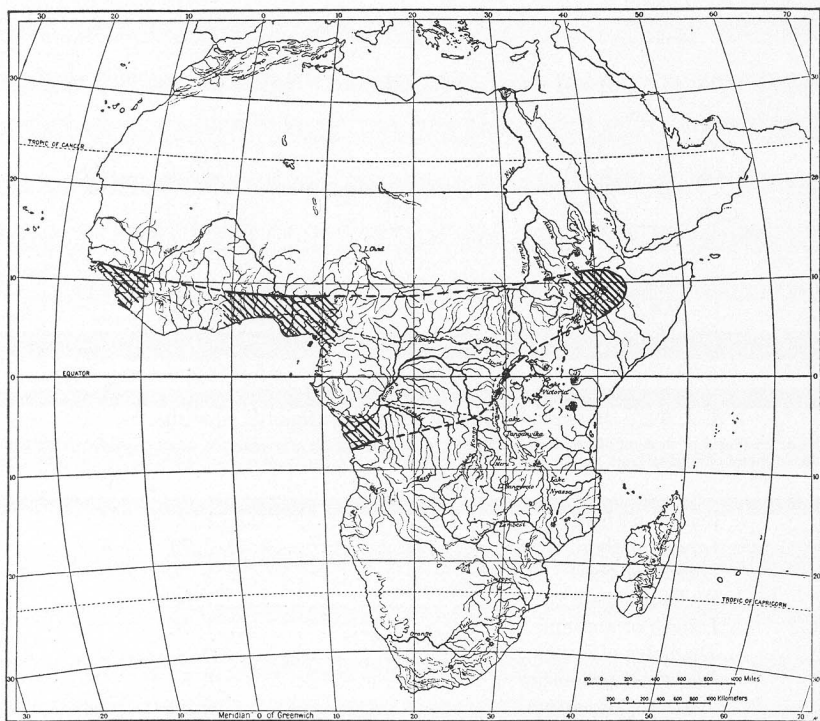
Length with wings.....	11.50 mm.
Length without wings.....	7.30-7.70
Length of head.....	1.15
Width of head.....	1.06
Length of antennæ.....	1.55
Diameter of eye.....	0.30
Length of pronotum.....	0.51
Width of pronotum.....	0.89
Length of hind tibia.....	0.95
Length of anterior wing.....	9.86
Width of anterior wing.....	2.25

Close to *M. sjöstedti* but the ocelli seem to be larger in *M. wasmanni*. Ocelli are closer to the eye than in either *M. cristifrons* or *M. lamanianus*. The wings are also narrower than in *M. lamanianus*.

SOLDIER.—Head reddish yellow, forehead a little darker. Head rectangular, short; sides straight and parallel; profile with a nearly vertical forehead making a rather sharp angle where it joins the vertex; gula with a distinct projection in the

middle. Labrum rather deeply cut with two somewhat pointed projections. Mandibles not very strongly curved and with a small tooth at the base of each. Anterior margin of the pronotum slightly emarginate.

Length of head with mandibles.....	2.60 mm.
Width of head.....	1.10
Length of antennæ.....	2.00
Length of pronotum.....	0.25
Width of pronotum.....	0.55
Length of hind tibia.....	0.89
Length of left mandible.....	1.50



Map 20. Distribution of the subgenus *Basidentitermes*.

M. sjöstedti, *M. curvatus* and *M. arboricola* do not have the gular projection. The labrum of *M. lounsburyi* is not deeply cut. The angle formed by the forehead and the vertex is more sharply pointed in *M. acutifrons*. The mandibles are different in shape in *M. undulans*. The gular projection in *M. lamanianus* is farther forward. The specimens before me agree perfectly with specimens of *M. cristifrons* from Stanley-

ville determined by Schmitz and it is difficult to distinguish the soldiers of these two species.

Type Locality.—Bipindi, Cameroon: No. 20, G. Zenker Coll., 1920.

The descriptions are based upon several imagos and soldiers from Bipindi.

Subgenus **BASIDENTITERMES** Holmgren

This peculiar subgenus also is known from only a few localities so that its distribution (Map 20) is problematical. I have included *Eutermes gastroanus* from Abyssinia in the map, a species known only from the imago and only doubtfully included in this subgenus. It is possible that the subgenus may be absent in the rain-forest of the Congo basin as it did not occur in the extensive collections made by Rev. H. Kohl, S.J., near Stanleyville.

Mirotermes (Basidentitermes) malelaensis, new species

Text Figure 70

SOLDIER.—Head reddish yellow to reddish brown; rather short; sides and posterior margin rounded; sides with a slight depression in back of the base of the

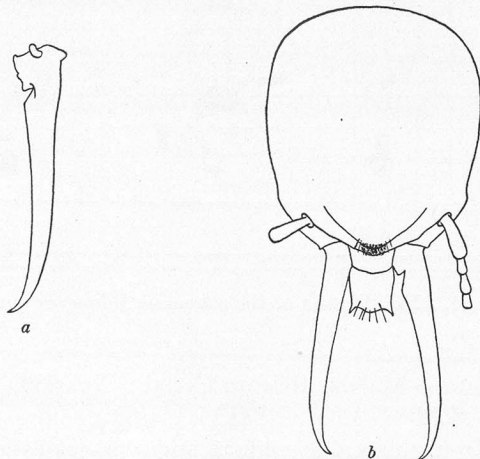


Fig. 70. *Mirotermes (Basidentitermes) malelaensis*, new species.

a, left mandible of soldier; b, head of soldier from above.

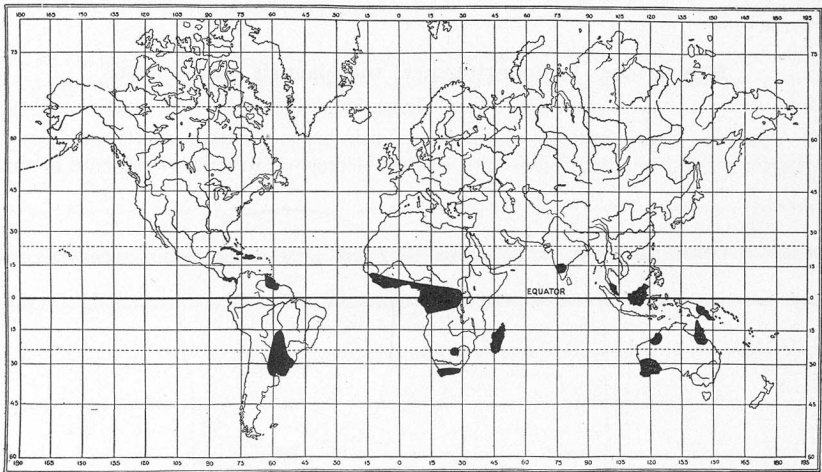
antennæ. Antennæ with 14 segments, the third longer than the second, the second equal to the fourth. Tip of labrum with two sharp points and a median lobe; sides somewhat curved. Mandibles slender and long, somewhat curved inward. Right mandibles with an acute incision near the base. Left mandible with a smooth inner margin. Anterior margin of the pronotum very weakly emarginate.

Length of head with mandibles.....	3.45 mm.
Width of head.....	1.63-1.73
Length of antennæ.....	2.30
Length of pronotum.....	0.33
Width of pronotum.....	0.78-0.84
Length of hind tibia.....	1.35
Length of left mandible.....	1.70-1.73

M. potens, *M. mactus* and *M. aurivillii* are smaller. The junction of the forehead and vertex forms a rather sharp angle in *M. diversifrons*.

WORKER.—Antennæ with 14 segments.

Width of head.....	1.10 mm.
Length of hind tibia.....	1.05



Map 21. Distribution of the subgenus *Mirotermes*, *s.str.*

Type Locality.—Malela, Belgian Congo: No. 239, Bequaert Coll.
Holotype.—Soldier (A. M. N. H.).

•Described from numerous soldiers and workers collected from the type locality by Dr. Bequaert and Mr. Lang in the first week in July, 1915.

“From galleries made underneath a fallen trunk of a palm tree, in swampy woods along the banks of the Congo” (Bequaert, No. 239, June 4, 1915).

“Living in channels on the outside of a fallen oil palm (*Elaeis*)” (Lang, July 6, 1915).

Subgenus **MIROTERMES** Wasmann

The distribution of the typical subgenus seems to be discontinuous although many of the gaps may ultimately be bridged (Map 21). Since completing the map Sjöstedt (1926) has placed *Eutermes heteraspis* Silvestri in this group from Adi Ugri, Eritrea and Snyder has described a new species from Ivon, Bolivia. The genus has also been reported from Ceylon, Torres Strait, region of Darwin (Northern Territory), and Sumatra. In central Africa it seems to be confined to the rain-forest region but it is also known from the more arid regions on the Cape of Good Hope and is well represented in Australia.

The mandibles of the soldier are attenuated and are adapted for snapping rather than biting. Thus they can be separated from the group of subgenera related to *Cubitermes*. *Promirotermes*, *Cavitermes*, *Crepititermes*, *Angulitermes*, and *Protocapritermes* also possess similarly shaped mandibles but the frontal projection is either absent or is shaped differently.

Fuller (1925b) has recently described several South African species which he refers to this subgenus. From his descriptions, it seems probable that *M. dumisæ* together with *M. rotundifrons* Silvestri should be assigned to *Promirotermes* and *M. elsenburgi* and *M. braunsi* Wasmann together with *M. frontalis* Silvestri should be assigned to *Angulitermes*.

Two species were found in the collections before me, one of which seems to be new to science.

Mirotermes (Mirotermes) langi, new species

Text Figure 71

IMAGO.—Head rather dark brown, oval; fontanelle small, white. Antennæ with 15 segments, the third shorter than the fourth, the fourth slightly shorter or equal to the second. Eyes rather large and fairly close to the lower margin of the head, not very prominent. Ocelli small, about their width from the eyes. Post-clypeus slightly lighter than the head, with a median line. Pronotum slightly lighter than the head; angles rounded; posterior margin not emarginate. Posterior margins of the meso- and metanota emarginate, the angle formed in the margin of the mesonotum a little more than a right angle. Wings brown, transparent.

Length with wings.....	8.30 mm.
Length without wings.....	5.80
Length of head.....	1.03
Width of head.....	0.90
Length of antennæ.....	1.47
Diameter of eye.....	0.25
Length of pronotum.....	0.47
Width of pronotum.....	0.76
Length of hind tibia.....	0.90
Length of anterior wing.....	6.25
Width of anterior wing.....	1.80

SOLDIER.—Head yellow, rectangular, sparsely covered with bristles. Antennæ with 14 segments, the third longer than the second, the second and fourth about equal, the third segment sometimes showing traces of a division which would make 15 segments. Labrum with two sharp points at the end. Mandibles black, typical *Mirotermes*, *s.str.* Nose rather short, front slightly concave. Pronotum saddle-shaped with a large anterior lobe. Anterior margin somewhat emarginate.

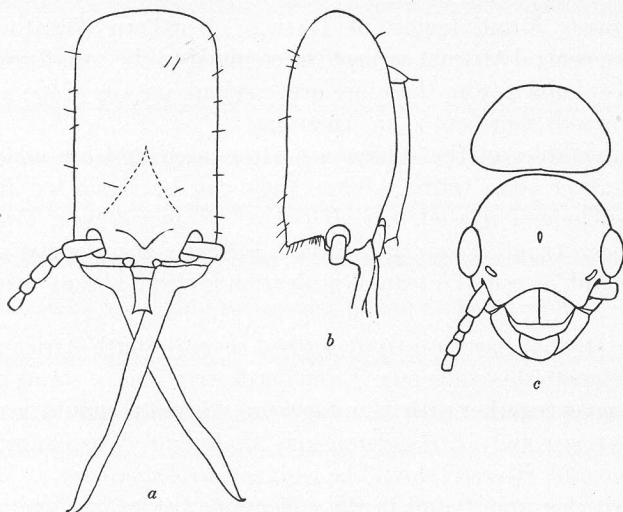


Fig. 71. *Mirotermes (Mirotermes) langi*, new species.

a, head of soldier from above; *b*, head of soldier from the side; *c*, head and pronotum of imago from above.

Abdominal tergites thickly covered with short hairs and a row of bristles on the posterior margin of each tergite and sternite.

Length of head with mandibles.....	3.20 mm.
Length of head to tip of labrum.....	1.94
Width of head.....	0.90–0.92
Length of antennæ.....	1.82
Length of pronotum.....	0.31
Width of pronotum.....	0.60
Length of hind tibia.....	0.78–0.87
Length of left mandible.....	1.67

Cotypes of *M. baculi* have a proportionately wider head. *M. hospes* is smaller. The nose is more pointed in *M. capensis*.

WORKER.—Antennæ with 14 segments. Mandibles with the same dentation as *M. hospes* but larger.

Length of head.....	1.00 mm.
Width of head.....	0.81

Type Locality.—Region of Stanleyville, Belgian Congo: Kohl Coll.

Other Locality.—Medje, Belgian Congo: No. 722, Lang-Chapin Coll., June, 1914.

Holotype.—Soldier (A. M. N. H.).

Morphotype.—Imago (A. M. N. H.).

The descriptions are based upon several imagos from the region of Stanleyville and numerous soldiers and workers from both the above localities. The Stanleyville specimens were determined by Schmitz as *M. obtectus* Silvestri.

Lang states that the specimens from Medje were found attacking the house in which he was living.

I take pleasure in naming this species in honor of Mr. Herbert Lang who collected such a valuable series of termites, together with notes and photographs, upon which this report is largely based.

***Mirotermes* (*Mirotermes*) *hospes* (Sjöstedt)**

Text Figure 72

SOLDIER.—Head yellow, rectangular, short compared to *M. langi*. Antennæ with 14 segments, the third shorter than the second, the third and fourth equal or the

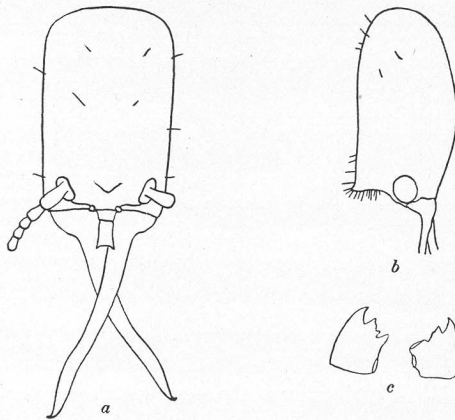


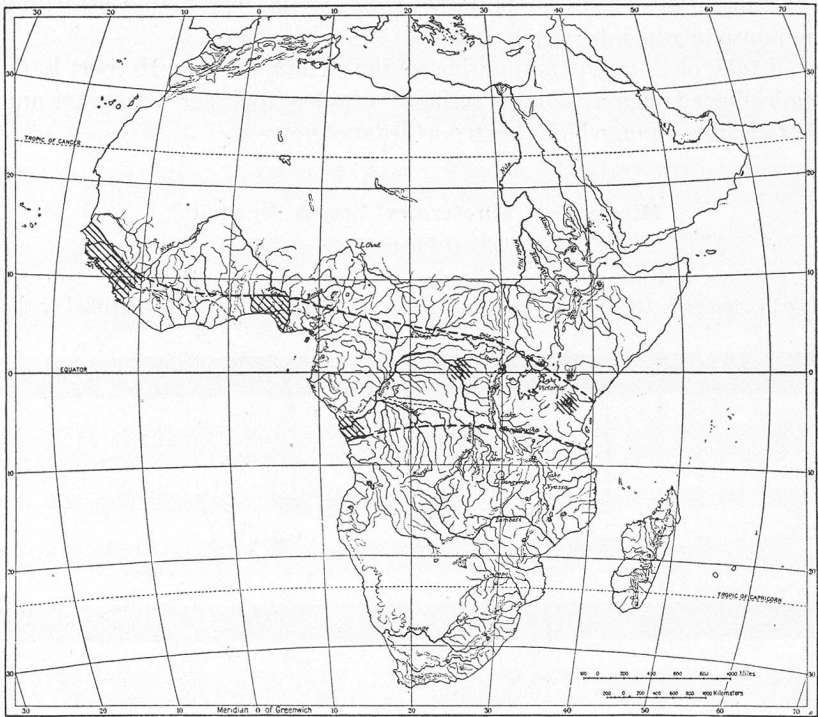
Fig. 72. *Mirotermes* (*Mirotermes*) *hospes* (Sjöstedt).

a, head of soldier from above; b, head of soldier from the side; c, mandibles of worker.

third segment equal to the second and the fourth a little shorter than the third. Sometimes all are subequal. Labrum with two sharp points. Mandibles black, long, typical for this subgenus. Nose short, front vertical. Anterior margin of the pronotum not emarginate.

Length of head with mandibles.....	2.50-2.70 mm.
Width of head.....	0.78-0.83
Length of antennæ.....	1.67
Length of pronotum.....	0.27
Width of pronotum.....	0.33
Length of hind tibia.....	0.67
Length of left mandible.....	1.33

M. capensis, *M. baculi* and *M. baculiformis* are larger. The mandibles of the worker of *M. obtectus* figured by Silvestri seem to differ somewhat



Map 22. Distribution of the subgenus *Promirotermes*.

in dentation. Cotypes of *M. obtectus* soldiers have a larger head, longer mandibles and a narrower gula, but otherwise are very close.

WORKER.—Antennæ with 14 segments. See Fig. 72 for dentation of mandibles.

Length of head.....	0.89 mm.
Width of head.....	0.78
Length of hind tibia.....	0.56

Localities.—Bipindi, Cameroon: Nos. 28, 40 and 63, G. Zenker Coll., 1920. Katala, between Zambi and Malela, Belgian Congo: No. 215, Bequaert Coll., June 18, 1915.

Described from many soldiers and workers from the above localities.

Dr. Bequaert includes the following description of the nest of these termites in his field notes. "From a black carton nest built on the sides, near the base of the trunk, of a palm (*Elaeis*), in swampy woods along the banks of the Congo."

Subgenus **PROMIOTERMES** Silvestri

Only a few localities for this subgenus have been reported so that the distribution (Map 22) is only tentative. It can be seen, however, that both savanna and rain-forest regions have been invaded.

I believe that *M. dumisæ* Fuller belongs to this subgenus together with *M. rotundifrons* Silvestri. The inclusion of these two species extends the range beyond that shown in the map to include Kooa, Kalahari; Wolf-ton, Bushmanland; Leydsdorp and Belfast, Transvaal; and Dumisa, Natal.

The single species represented in the collections seems to be new.

Mirotermes (Promirotermes) orthocephs, new species

Text Figure 73

SOLDIER.—Head yellow; strongly narrowed in front; sides fairly straight. Antennæ with 14 segments, the third very long (.22–.32 mm.), the second and fourth about equal. Labrum with a concave anterior margin ending in two sharp points. Mandibles long and slender, black, adapted for snapping. Anterior margin of the pronotum weakly emarginate.

Length of head with mandibles.....	3.00–3.10 mm.
Width of head.....	1.10–1.17
Length of antennæ.....	2.20
Length of pronotum.....	0.27
Width of pronotum.....	0.55
Length of hind tibia.....	1.27
Length of left mandible.....	1.77–1.84

The anterior margin of the pronotum is deeply cut in *M. bellicosus*. *M. gracilipes* is larger and the sides of the head are not as straight.

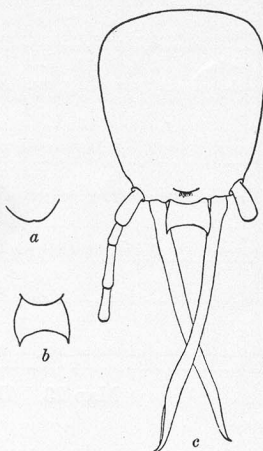


Fig. 73. *Mirotermes (Promirotermes) orthocephs*, new species.

a, front margin of pronotum of soldier; b, labrum of soldier; c, head of soldier from above.

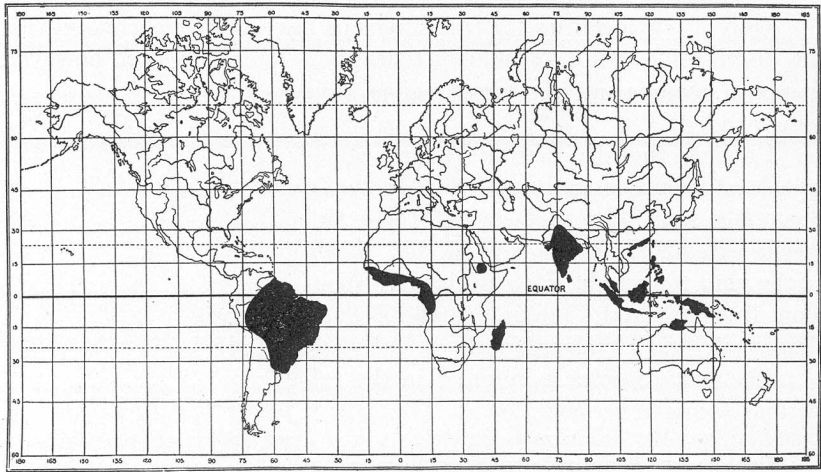
M. holmgreni has a more bulging frontal projection and the sides of the head are not straight.

Type Locality.—Banana, Belgian Congo: Lang-Chapin Coll., August, 1915.

Other Locality.—Malela, Belgian Congo: Bequaert Coll., July 4, 1915.

Holotype.—Soldier (A. M. N. H.).

Described from numerous soldiers collected from the above localities, the Banana specimens being taken from a vial containing *Mirotermes*



Map 23. Distribution of the genus *Capritermes*, s.lat.

(*Cubitermes*) *congoensis* and the Malela specimens being taken from a vial containing *Nasutitermes minusculus*.

CAPRITERMES Wasmann

The distribution of this genus (including all the termites with extremely asymmetrical mandibles) seems to be discontinuous (Map 23). Since the map was completed Snyder has reported a species of *Neocapritermes* from Rio Frio, Columbia. The following localities should also be included: Sukli, Lower Burma; Mauda, Belgian Congo. The species formerly referred to this genus from northern Australia belong to *Mirotermes* and should be omitted from the map. The genus has been divided into three subgenera, one of which is represented in the collections before me.

Subgenus **PERICAPRITERMES** Silvestri

This subgenus was described by Silvestri (1914) as a genus. Eight species were included, one of which is represented in the collections before me. It seems probable that all the species of *Capritermes* in the Ethiopian region belong to this subgenus with the exception of *C. alienus* which Holmgren has referred to *Neocapritermes* and which may have been introduced into Abyssinia.

Capritermes (Pericapritermes) urgens (Silvestri)

Text Figure 74

SOLDIER.—Head yellow, elongated, rectangular with a line running from the middle of the posterior margin nearly to the opening of the frontal gland. Antennæ with 14 segments, the fourth shorter than the third, the second and third about equal. Mandibles black.

Length of head with mandibles.....	3.50–3.60 mm.
Length of head to tip of labrum.....	2.30
Width of head.....	1.07–1.13
Length of antennæ.....	2.00
Length of pronotum.....	0.27
Width of pronotum.....	0.60
Length of hind tibia.....	0.96
Length of left mandible.....	1.50

The left mandible in Silvestri's figure of *C. urgens* shows more of a curve in the outer portion than the specimens before me, but I believe them to be the same species. The Bipindi specimens come closest to the measurements of var. *nigeriana* and they may possibly belong to this variety. The specimens also seem to answer the description of the soldier of *C. socialis* Sjöstedt.

Locality.—Bipindi, Cameroon: Nos. 20, 28, G. Zenker Coll., 1920.

Described from 5 soldiers from the above locality.

MICROCEROTERMES Silvestri

As explained in the discussion of the genus *Nasutitermes* I have retained the name *Microcerotermes* for this genus instead of *Eutermes* as suggested by Banks (Banks and Snyder, 1920).

The genus varies little throughout its range and no one has ever seen fit to separate it into subgenera. Its distribution (Map 24) seems to be

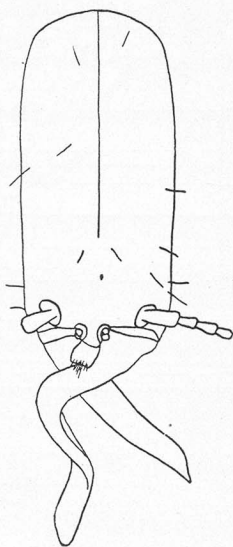
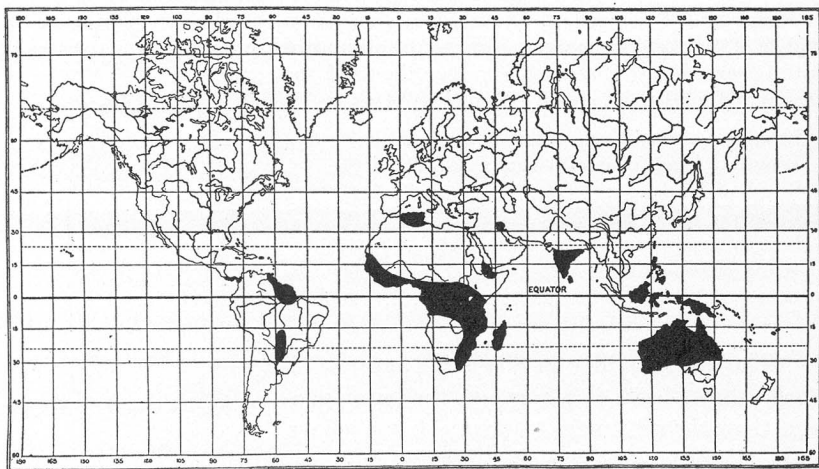


Fig. 74. *Capritermes* (*Pericapritermes*) *urgens* Silvestri.

Head of soldier from above.

discontinuous and it is probably a very ancient group. It has been reported from north Africa and Mesopotamia as well as from the tropical regions of the Old and New World. Since completing the map Snyder has reported the genus from the Solomon Islands, Honduras, Guatemala, Columbia and Bolivia, and Fuller (1925*b*) reports a species from Malmesbury, South Africa. Also Sumatra, Java, Victoria, and Australia should be included in the map.

Five species and one variety are represented in the collections before me, one species of which seems to be new.



Map 24. Distribution of the genus *Microcerotermes*.

***Microcerotermes edentatus* Wasmann**

Plate XXXIV, Figure 2

SOLDIER.—Head reddish yellow; rather long; sides parallel and a little more rounded than in var. *transiens*. Antennæ with 13 segments, the third smaller than the fourth, the second equal to the fourth. Labrum rather long, rounded, with a slight indication of three points. Mandibles without teeth, very minutely serrated, black. Anterior margin of the pronotum very conspicuously emarginate, a little more so than in var. *transiens*.

Length of head with mandibles.....	3.33–3.43 mm.
Width of head.....	1.23–1.30
Length of antennæ.....	1.83
Length of pronotum.....	0.46
Width of pronotum.....	0.80
Length of hind tibia.....	1.16
Length of left mandible.....	1.27

M. edentatus var. *transiens* is smaller and the sides of the head are straighter.

Von Rosen described the variety *transiens* as a variety of *M. fuscotibialis*, subspecies *libericus*, because he found it in the nest with this subspecies. The specimens described here were found in the same vial with *M. fuscotibialis*. This may be significant, but it is difficult to believe that *M. edentatus* is merely a form of *M. fuscotibialis*.

Locality.—Stanleyville, Belgian Congo, Lang-Chapin Coll., Aug. 29, 1909.

Described from several soldiers found in the same vial with *Microcerotermes fuscotibialis*.

***Microcerotermes edentatus* Wasmann variety *transiens* (von Rosen)**

Text Figure 75

SOLDIER.—Head reddish yellow, darker in front; long, sides slightly rounded. Antennæ with 13 segments, the third shortest, sometimes much smaller than the fourth and sometimes nearly equal. Inner margins of the mandibles without teeth, minutely serrated. Anterior margin of the pronotum emarginate.

Length of head with mandibles.....	3.10-3.17 mm.
Width of head.....	1.17-1.26
Length of antennæ.....	1.60
Length of pronotum.....	0.41
Width of pronotum.....	0.67-0.70
Length of hind tibia.....	1.00-1.05
Length of left mandible.....	1.17

The typical form from Stanleyville is a little larger than these specimens from Bipindi which agree very well with cotypes of the variety *transiens* which was described as a variety of *M. fuscotibialis*, subsp. *libericus*.

Locality.—Bipindi, Cameroon: No. 3, G. Zenker Coll., April, 1920.

The description is based upon numerous soldiers from 3 different vials all bearing the same number from the above locality.

***Microcerotermes silvestrianus*, new species**

Text Figure 76

SOLDIER.—Head reddish yellow; oblong; the sides somewhat rounded. The second segment of the antennæ equal to the third, the fourth slightly longer than the third. Tip of labrum somewhat pointed, sides converging somewhat toward the rear. Mandibles curved, tips strongly curved; black; inner margin strongly serrated. Anterior margin of the pronotum conspicuously emarginate, angles rounded.

Length of head with mandibles.....	3.22 mm.
Length of head to base of antennæ.....	1.67
Width of head.....	1.22
Length of pronotum.....	0.39
Width of pronotum.....	0.78
Length of left mandible.....	1.20-1.30

The mandibles are proportionately longer and the head slightly smaller in *M. dolichognathus* and the anterior margin of the pronotum is not as deeply emarginate. *M. fuscotibialis*, *M. fuscotibialis* subsp.

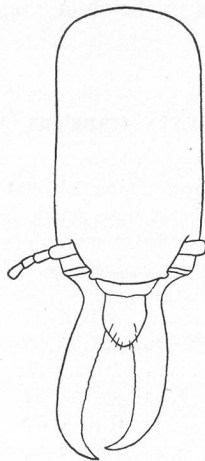


Fig. 75

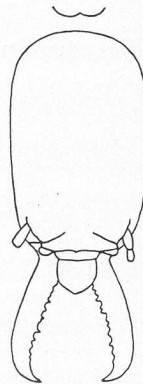


Fig. 76

Fig. 75. *Microcerotermes edentatus* Wasmann variety *transiens* von Rosen.
Head of soldier from above.

Fig. 76. *Microcerotermes silvestrianus*, new species.
Head and front margin of pronotum of soldier from above.

libericus, and *M. subtilis* are smaller. *M. fuscotibialis* subsp. *validior* is quite close but Silvestri's (1914) figure shows much weaker dentation of the mandibles. The third segment of the antennæ is much smaller than the second in *M. fuscotibialis* subsp. *libericus*. *M. bequaertianus* has straight sides to the head.

Type Locality.—Between Lukolela and Basoko, Belgian Congo: No. 1027, Lang-Chapin Coll., July 17, 1909.

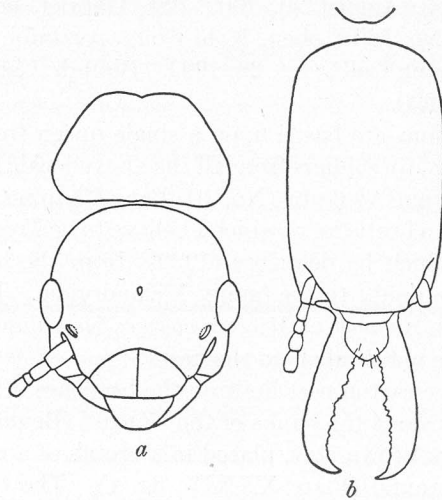
Holotype.—Soldier (A. M. N. H.).

Described from 3 soldiers collected on firewood brought on the boat. I have named the species in honor of the eminent termitologist, Prof. F. Silvestri.

Microcerotermes fuscotibialis (Sjöstedt)

Plates XXXIV, XXXV; Text Figure 77

IMAGO.—Head light yellow brown; somewhat rectangular; sides straight and parallel. Fontanelle small, same color as the head. The third segment of the antennæ small, the fourth a little shorter than the second. Eyes of medium size, not prominent, fairly close to the lower margin of the head. Ocelli rather small, less than their width from the eyes. Postclypeus lighter than the head, with a median line. Pronotum slightly lighter than the head; posterior margin emarginate. Pronotum almost as wide as the head with the eyes. Posterior margins of the meso- and metanota widely emarginate.

Fig. 77. *Microcerotermes fuscotibialis* (Sjöstedt).

a, head and pronotum of imago from above; b, head and front margin of pronotum of soldier from above.

Length of head.....	1.23 mm.
Width of head.....	1.10
Diameter of eye.....	0.32
Length of pronotum.....	0.60
Width of pronotum.....	0.99
Length of hind tibia.....	1.11
Length of queen.....	20.00
Width of abdomen of queen.....	3.00

SOLDIER.—Head reddish yellow, oval rectangular; sides rounded. Antennæ with 13 segments, the third smallest, nearly as long as the second, the fourth wider and longer than the third. Mandibles red-brown, stout, serrations comparatively strong and irregular. Anterior margin of the pronotum slightly or not at all emarginate, a small transparent piece sometimes filling up the notch.

Length of head with mandibles.....	2.89-3.00 mm.
Width of head.....	1.10-1.15
Length of antennæ.....	1.67
Length of pronotum.....	0.33
Width of pronotum.....	0.72-0.75
Length of hind tibia.....	0.90-1.00
Length of left mandible.....	1.20

Localities.—Zambi, Belgian Congo: No. 231, Bequaert Coll., June 30, 1915; Lang-Chapin Coll., June 30, 1915. Leopoldville, Belgian Congo: Lang-Chapin Coll., July 11, 1909. Stanleyville, Belgian Congo: Lang-Chapin Coll., August 29, 1909. St. Gabriel, near Stanleyville, Belgian Congo: No. 52TZ oben, Kohl Coll. Avakubi, Belgian Congo: No. 10, Lang-Chapin Coll., Oct. 28, 1909. Bipindi, Cameroon: No. 58, G. Zenker Coll., 1920.

The descriptions are based upon a single queen from the region of Stanleyville and many soldiers from all the above localities.

In the vial from Avakubi (No. 10, Lang-Chapin Coll.), I found a single specimen of a beetle larva which I believe to be *Troctontus appendiculatus* Silvestri which he describes (1920b) from the larvæ alone and assigns with some doubt to the family Melandryidæ. This species was originally found in the nest of *Microcerotermes fuscotibialis*.

Following are notes taken on the nests:

"From a large carton nest built on the branches of *Ficus congoensis* in swampy woods along the banks of the Congo" (Bequaert, No. 231).

"Nest of dark brown clay, placed in a crotch of a mango tree some 8 feet from the ground (Plate XXXIV, fig. 1). The trunk of the tree bore many covered passageways connecting with this nest" (Chapin, Leopoldville, July 11, 1909).

"The nests are of very irregular form and structure (Plate XXXIV, fig. 2). The form depends much on its support as every nest is adapted to the branches to which it is attached or which the nest surrounds. The nest looks much like the nest of the black ants. I found one nest which was inhabited by both small black ants and termites. It appears that the small black ants drive out the termites. There is one difference that distinguishes at a glance the nest inhabited by ants and that inhabited by these termites. The ants have no covered passageways along the stem of the trees leading to their nest but the termites have passageways through which they travel unseen. I cut open three of these nests, one showing horizontal divisions at unequal distances from each other. The nest consisted of very irregular cells, generally one-third or one-half inch wide. The walls are very thin, one-sixteenth of an inch or less thick.

The nest is hard, but rather light. The color is grayish brown outside and dark brown inside. The nest of these termites is also provided with stalactite protuberances especially on its lower surface that never can be seen on the nest of the black ants. Some of them are hollow nearly to the tip" (Lang, Stanleyville, August 29, 1909).

***Microcerotermes progrediens* (Silvestri)**

Plate XXXVI; Text Figure 78

SOLDIER.—Head light reddish yellow, proportionately long; sides straight and parallel. Antennæ with 13 segments, the third shortest, the fourth nearly as long as the second. Labrum pentagonal, sides straight. Mandibles proportionately short, with short serrations. Anterior margin usually conspicuously emarginate. One specimen, however, from Poko shows no emargination although the other soldier in the same vial is emarginate.

Length of head with mandibles.....	2.16–2.40 mm.
Length of head to tip of labrum.....	1.83–1.90
Length of head to base of antennæ.....	1.40–1.43
Width of head.....	0.87–0.89
Length of antennæ.....	1.16–1.17
Length of pronotum.....	0.35
Width of pronotum.....	0.53–0.57
Length of hind tibia.....	0.70–0.73
Length of left mandible.....	0.90–0.94

I believe this form, which was described as a variety of *M. brachignathus* by Silvestri, deserves specific rank because of the difference in the shape of the mandibles. The specimens differ from the type specimens of *M. secernens* Schmitz which I have before me in having a proportionately longer and narrower head and shorter mandibles. Cotypes of *M. progrediens* agree very well, but have a slightly narrower head. *M. solidus* metatypes in my collection differ only in having a slightly shorter and wider head. *M. solidus* is close but the mandibles are a little shorter. The head is wider and proportionately longer than in *M. parvus*. Specimens from Senegambina have a little longer heads (2.50 mm.) but I believe them to be the same species.

WORKER.—Antennæ with 13 segments.

Width of head.....	.92 mm.
Length of hind tibia.....	.56

Localities.—Senegambina, Cameroon: No. 291, B. C. Z. Evans Coll., April 28, 1929. Poko, Belgian Congo: No. 614, Lang-Chapin Coll., August, 1913.

The descriptions are based on numerous soldiers and workers from the above localities.

Plate XXXVI shows a nest from which Mr. Lang collected this species at Poko. The nest is probably a deserted or invaded nest of *Mirotermes* (*Procubitermes*) *niapuensis* (cf. Plate XXXII, fig. 2). It is certain that no species of *Microcerotermes* builds such an elaborate construction.

***Microcerotermes parvus* (Haviland)**

Plate XXXIII, Fig. 1; Text Figure 79

SOLDIER.—Head reddish yellow, rectangular; sides straight and parallel; posterior margin rounded. Antennæ with 13 segments, the third nearly as long as the

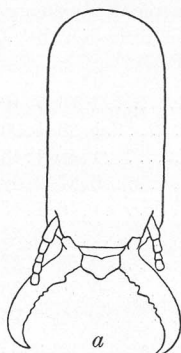


Fig. 78

Fig. 78. *Microcerotermes progreddiens* Silvestri.
a, head of soldier from above; b, labrum of soldier.

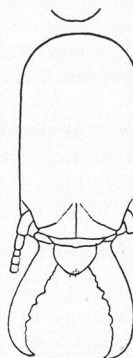


Fig. 79

Fig. 79. *Microcerotermes parvus* (Haviland).
Head and front margin of pronotum of soldier from above.

fourth but much narrower at the base, the second longer than the fourth. Mandibles reddish brown, inner margins dentated. Anterior margin of the pronotum very weakly emarginate.

Length of head with mandibles.....	2.10 mm.
Width of head.....	0.78
Length of antennæ.....	1.10
Length of pronotum.....	0.26
Width of pronotum.....	0.50
Length of hind tibia.....	0.62
Length of left mandible.....	0.82

The anterior margin of the pronotum is conspicuously emarginate in *M. progrediens* and the sides of the head are more rounded. The head of *M. acerbus* is much longer. *M. debilicornis* is close but seems to have a longer and narrower head. *M. zuluensis* is very close but seems to have a shorter head. Fuller (1925b) states that records of this species outside of Natal need confirmation and it is possible that I have misidentified the specimens before me. However, Fuller's description coincides exactly with the Garamba specimens and the cotype soldier agrees.

Locality.—Garamba, Belgian Congo: No. 460, Lang-Chapin Coll., July, 1912.

Described from 2 mature soldiers and 2 immature soldiers taken together with several other species. I believe the photographed nest was built by *Mirotermes* (*Cubitermes*) *sankurensis* (Plate XXXIII, fig. 1).

APPROXIMATE LOCATION OF AFRICAN AND MALAGASIAN
LOCALITIES, RIVERS, MOUNTAINS, LAKES, ETC.,
FROM WHICH TERMITES ARE RECORDED

- | | |
|--|---|
| Abassas.—On the Orange River, Namaqualand. | Amarr.—See Burgi. |
| Abo.—5° 30' N., 6° 25' E. | Amboni (River).—0° 20' S., 36° 55' E. |
| Abou.—Abyssinia. | Ambovo.—Madagascar. |
| Aburi.—5° 45' N., 0° 10' W. | Amiranten (Islands).—5° S., 53° 30' E. |
| Accra.—See Akra. | Andevorante.—19° S., 49° E. |
| Addis Abbeba.—See Addis Abeba. | Andranohinaly.—S. W. Madagascar. |
| Addis Abeba.—9° N., 38° 45' E. | Angu.—3° 30' N., 24° 20' E. |
| Adi Ugri.—14° 55' N., 38° 50' E. | Anjouan (Island).—20° 25' S., 24° 30' E. |
| Agadema Kouiz.—17° N., 13° E. | Ankavandra.—18° 50' S., 45° 20' E. |
| Agege.—6° 40' N., 3° 20' E. | Annobon (Island).—1° 15' S., 6° E. |
| Agoncho.—Gabun. | Appelbosch.—Natal. |
| Akenge.—2° 55' N., 26° 50' E. | Arbat, Chor.—See Chor Arbat. |
| Akkra.—See Akra. | Assab.—13° 5' N., 42° 50' E. |
| Akra.—5° 30' N., 0° 15' W. | Assuan.—24° 5' N., 32° 50' E. |
| Akropong.—6° N., 0° 5' W. | Athi (River).—1° S., 37° E.—3° S., 40° 10' E. |
| Alahina.—Sudan. | Athi-ya-Marve.—In Athi Plains, British East Africa. |
| Albany.—33° 20' S., 26° 25' E. | Avakubi.—1° 20' N., 27° 40' E. |
| Albert-Nyanza.—See Lake Albert. | Avoca.—Natal. |
| Alberto (Lake).—See Lake Albert. | |
| Alberton.—26° 20' S., 28° 5' E. | Babeyru.—1° 50' N., 27° 30' E. |
| Aldabra (Island).—9° 20' S., 46° 30' E. | Bafwabaka.—2° 5' N., 27° 45' E. |
| Aldebra (Island).—See Aldabra. | Bahr el Abiad (River).—9° 15'–16° N., 32°–33° E. |
| Alexandria.—33° 45' S., 26° 25' E. | Baie de Baly.—16° 20' S., 45° 30' E. |
| Alicedale.—33° 20' S., 26° 5' E. | Balandougou.—Niger River. |
| Amani.—5° 5' S., 38° 40' E. | |
| Amanzimtoti.—30° 5' S., 30° 50' E. | |

- Bamanga.—0° 20' S., 25° 30' E.
 Bamba.—7° S., 13° 40' E.
 Banana.—6° S., 12° 20' E.
 Bandiagara.—14° 20' N., 3° 30' W.
 Banga Kosi.—Belgian Congo.
 Banguelo.—See Bangweolo (Lake).
 Bangui.—South East Africa.
 Bangweolo (Lake).—10° 30'–11° 30' S.,
 29° 30'–30° 15' E.
 Bania.—4° N., 16° 5' E.
 Bara.—13° 40' N., 30° 20' E.
 Bara-Land.—Center about 22° 40' S.,
 45° 35' E.
 Barberton.—25° 50' S., 31° E.
 Bardera.—2° 30' N., 42° 30' E.
 Barkly West.—28° 40' S., 24° 20' E.
 Barumbu.—1° 10' N., 23° 20' E.
 Basoko.—1° 20' N., 23° 35' E.
 Basongo.—4° 24' S., 20° 20' E.
 Batama.—1° N., 26° 40' E.
 Bathurst.—33° 40' S., 26° 50' E.
 Bator.—6° 5' N., 0° 25' E.
 Beaufort West.—32° 20' S., 22° 35' E.
 Beira.—20° S., 35° E.
 Belfast.—25° 45' S., 30° 2' E.
 Belia.—Moyen-Niger Basin.
 Bellair.—29° 55' S., 30° 50' E.
 Beni.—0° 20' N., 29° 40' E.
 Benguela.—See Bangweolo Lake.
 Benoni.—26° 15' S., 29° 25' E.
 Berek.—Tripoli.
 Bethal.—26° 25' S., 29° 30' E.
 Bethlehem.—28° 15' S., 28° 20' E.
 Bikoro.—1° S., 18° E.
 Bimbia.—3° 55' N., 8° 30' E.
 Binda.—0° 20' N., 6° 43' E.
 Bipindi.—3° 5' N., 10° 25' E.
 Bir Amira.—Sudan.
 Bir Joghlan.—Anglo-Egyptian Sudan.
 Bismarckburg.—8° 5' N., 1° 20' E.
 Bissao.—11° 45' N., 15° 40' W.
 Bissau.—See Bissao.
 Bloemfontein.—29° 5' S., 26° 10' E.
 Blue Post.—1° 5' S., 37° 10' E.
 Bogos.—15° 50' N., 38° E.
 Bolama.—11° 45' N., 15° 35' W.
 Bolo.—32° 25' S., 27° 35' E.
 Boma.—5° 50' S., 13° 10' E.
 Boma Sundi.—5° 20' S., 12° 50' E.
 Bone.—36° 55' N., 7° 45' E.
 Bonge.—See Mbonge.
 Bonjongo.—4° 5' N., 9° 10' E.
 Bothaville.—27° 20' S., 26° 35' E.
 Boukrat.—Abyssinia.
 Boutta.—Abyssinia.
 Brava.—1° 5' N., 44° 5' E.
 Brazzaville.—4° 25' S., 15° 20' E.
 Brits.—Transvaal.
 Buditu.—5° 25' N., 38° 30' E.
 Bugala.—0° 30' S., 32° 15' E.
 Bukama.—9° 15' S., 25° 40' E.
 Bulawayo.—20° 10' S., 28° 50' E.
 Bumba.—2° 10' N., 22° 30' E.
 Burgi.—5° 25' N., 37° 55' E.
 Bushveld Basin.—24° 30' S., 26° 45' E.
 Busoga.—0° 30' N., 33° 30' E.
 Bussu.—Uganda.
 Buta.—2° 50' N., 24° 50' E.
 Butiti.—0° 45' N., 30° 20' E.
 Buzi (River).—South Africa.
 Cairo.—30° 12' N., 31° 10' E.
 Camayenne.—9° 25' N., 13° 40' W.
 Camps Bay.—33° 55' S., 18° 20' E.
 Cape Debundscha.—4° 5' N., 9° E.
 Cape of Good Hope.—34° 55' S., 18° 30'
 E.
 Cassini.—11° 10' N., 15° W.
 Catende.—0° 15' N., 32° 25' E.
 Cedara.—29° 35' S., 30° 15' E.
 Ceres.—33° 25' S., 19° 20' E.
 Chari-Tchad (Lake).—12° 20'–14° 20'
 N., 13°–15° E.
 Charlestown.—27° 25' S., 29° 55' E.
 Cheri-Chera.—Tunis.
 Cheteni.—4° 5' S., 39° 40' E.
 Chinavane.—25° 10' S., 32° 35' E.
 Chinchoxo.—5° 15' S., 12° 15' E.
 Chopo (River).—Stanleyville Region,
 Belgian Congo.
 Chor Arbat.—19° 45' N., 37° E.
 Christiana.—27° 50' S., 25° 5' E.
 Clumber.—33° 30' S., 26° 55' E.
 Coerney.—33° 30' S., 25° 45' E.
 Colenso.—28° 45' S., 29° 50' E.
 Colesberg.—30° 45' S., 25° E.

- Conakry.—9° 25' N., 13° 45' W.
 Conjeni.—South Bank of White Mfolosi River, Zululand.
 Cordofan.—See Kordofan.
 Cotonou.—6° 40' N., 2° 25' E.
 Cradock.—32° 11' S., 25° 35' E.

 Dagago.—10° 20' N., 42° 25' E.
 Dakar.—14° 40' N., 17° 35' W.
 Dans le Souf.—Algeria.
 Daouenle.—French Somaliland.
 Dar Kaïd Enbarck Imi N'takandout.—Marocco.
 Darling.—33° 25' S., 18° 20' E.
 Dar-es-Salaam.—6° 50' S., 39° 15' E.
 Das poort.—Near Pretoria, Transvaal.
 Dealesville.—28° 50' S., 25° 40' E.
 De Ghoup.—Ceres District, S. W. Cape, South Africa.
 Delagoa Bay.—26° S., 32° 40' E.
 Derela.—Abyssinia.
 Derema.—5° 5' S., 38° 40' E.
 De Wildt.—24° 30' S., 26° 45' E.
 Die Moot.—Hartebeest poort dam, Transvaal.
 Dika.—7° 50' N., 18° 45' E.
 Dilling.—12° 5' N., 29° 40' E.
 Dime.—5° 35' N., 36° 50' E.
 Dint.—Somaliland.
 Dire Daoua.—See Dire-Daua.
 Dire-Daua.—9° 40' N., 41° 50' E.
 Djibouti.—11° 30' N., 43° 10' E.
 Dolo.—4° N., 42° E.
 Drakensberge (Mountains).—26° S., 31° E.
 Duivel's Kloof.—23° 40' S., 30° 10' E.
 Dukuda.—Zululand.
 Duma.—3° 50' N., 18° 35' E.
 Dumisa.—30° 20' S., 30° 35' E.
 Dungu (Uele).—3° 30' N., 28° 30' E.
 Durban.—29° 50' S., 31° E.

 Eala.—0°, 18° 20' E.
 East London.—33° S., 27° 55' E.
 Edeloud.—Kordofan Desert, Anglo-Egyptian Sudan.
 Edough.—36° 55' N., 7° 40' E.
 Efulen.—2° 40' N., 10° 30' E.

 Ekundu.—4° 30' N., 9° E.
 El Amira.—Sudan.
 Elgon (Mountain).—1° N., 34° 30' E.
 Elisabethville.—11° 45' S., 27° 40' E.
 Elliotdale.—31° 55' S., 28° 40' E.
 El Obeid.—13° 10' N., 30° 10' E.
 Eloby (Island).—1° N., 9° 30' E.
 Elcelsior.—Orange Free State.
 Elsenburg.—33° 45' S., 18° 45' E.
 Empangeni.—28° 43' S., 31° 5' E.
 Endessa.—Abyssinia.
 Enos Bush.—Natal.
 Enseleni.—See Mseleni.
 Entebbe.—0° 5' N., 32° 30' E.
 Entendwendi.—28° 19' S., 32° 6' E.
 Estcourt.—29° S., 29° 50' E.
 Europa (Island).—22° 25' S., 40° 30' E.

 Fandrarazana.—Tintingue Bay, East Coast, Madagascar.
 Faradje.—3° 40' N., 29° 40' E.
 Farim.—12° 35' N., 15° 15' W.
 Farm Okapchuri.—Near Okasise, German S. W. Africa.
 Farm Paulinenhof.—22° 35' S., 17° 20' E.
 Fenerive.—17° S., 49° 10' E.
 Fernando Po.—3° 30' N., 8° 30' E.
 Fianarantsoa.—21° 30' S., 47° E.
 Fort Archambault.—9° 5' N., 18° 35' E.
 Fort Crampel.—7° 10' N., 9° 20' E.
 Fort Dauphin.—25° S., 47° E.
 Fort de Possel.—See Fort Possel.
 Fort Portal.—0° 45' N., 30° 15' E.
 Fort Possel.—5° N., 19° 15' E.
 Fouta Djallon.—French Guinea.
 Frere.—28° 50' S., 29° 45' E.
 Fundu (Island).—5° 5' S., 39° 40' E.

 Gamangui.—2° N., 27° 30' E.
 Ganda Sundi.—4° 50' S., 12° 50' E.
 Garamba.—4° 10' N., 29° 40' E.
 George.—33° 55' S., 22° 30' E.
 Germiston.—26° 15' S., 28° 15' E.
 Gherba.—9° 30' N., 40° E.
 Gingeles' Village.—27° 33' S., 32° 25' E.
 Glen Lyon.—Griqualand West.
 Goanikontes.—22° 40' S., 14° 45' E.
 Godofelassi.—14° 45' N., 39° E.

- Gondar.—12° 45' N., 37° 25' E.
 Gondokoro.—4° 50' N., 31° 45' E.
 Gotta.—Abyssinia.
 Grahamstown.—33° 15' S., 26° 35' E.
 Grand Bassam.—5° 10' N., 3° 50' W.
 Grand Cape Mt.—6° 45' N., 11° 25' W.
 Graspan.—29° 20' S., 24° 20' E.
 Greetdale.—Barkly West, South Africa.
 Groot Drakenstein.—About 33° 50' S., 19° E.
 Grootfontein.—19° 35' S., 18° 55' E.
 Groot Letaba (River).—23° 32'–25° 5' S., 30°–31° 55' E.
 Grootvlei.—Orange Free State.
 Guaso Nyero (River).—British East Africa.
 Guengère.—Pungwe Valley, Mozambique.
 Gultan.—Anglo-Egyptian Sudan.
 Haenertsburg.—23° 55' S., 29° 55' E.
 Hann.—Senegal.
 Harar.—9° 20' N., 42° 5' E.
 Harba.—Abyssinia.
 Hardine.—Abyssinia.
 Haviland Rail.—Natal.
 Heidelberg.—26° 25' S., 28° 30' E.
 Hex River.—33° 30' S., 19° 35' E.
 Hicka.—Abyssinia.
 Hieka.—Abyssinia.
 High Flats.—Near Dumisa, Natal.
 Hillcrest.—Natal.
 Himbolld.—Natal.
 Himbolton.—Natal.
 Himo (River).—3° 10'–3° 35' S., 37° 35' E.
 Hlabisa (District).—About 28°–28° 20' S., 31° 45'–32° 35' E.
 Ho.—6° 35' N., 0° 30' E.
 Holfontein.—29° 55' S., 27° 5' E.
 Howick.—29° 25' S., 30° 15' E.
 Humansdorp.—34° S., 24° 40' E.
 Ibadan.—7° 25' N., 3° 55' E.
 Île de France.—See Mauritius.
 Illovo Lagoon.—30° 10' S., 30° 55' E.
 Inchanga.—Natal.
 Indo.—French Congo.
 Irumu.—1° 20' N., 30° E.
 Itoki.—5° N., 8° 25' E.
 Ituri (River).—1° 30' N., 26°–30' E.
 Jesser Point.—Sordwana Bay, Zululand.
 Johann-Albrechtshole.—4° 40' N., 9° 25' E.
 Johannesburg.—26° 10' S., 28° E.
 Kabambare.—4° 40' S., 27° 45' E.
 Kadogli.—Sudan.
 Kahe.—3° 30' S., 37° 25' E.
 Kairo.—See Cairo.
 Kairouan.—35° 40' N., 10° 5' E.
 Kaka.—10° 40' N., 32° 15' E.
 Kakoulima (Mountain).—9° 40' N., 13° 25' W.
 Kalau.—Kawende.
 Kalkfeld.—20° 50' S., 16° 10' E.
 Kamaiembi.—Belgian Congo.
 Kamaggas.—29° 45' S., 17° 25' E.
 Kamozi.—Uganda.
 Kampala.—0° 20' N., 32° 20' E.
 Kaolack.—14° N., 16° 30' W.
 Kandola.—Stanleyville Region, Belgian Congo.
 Kang.—23° 40' S., 22° 45' E.
 Kanya.—25° S., 25° 15' E.
 Kap Debundscha.—4° 5' N., 9° E.
 Kap Mesurado.—6° 30' N., 10° 45' W.
 Karema.—6° 25' S., 30° 15' E.
 Karibib.—21° 55' S., 15° 50' E.
 Karshawal.—12° N., 32° 45' E.
 Karssa.—Abyssinia.
 Kartum.—See Khartum.
 Kasenga.—10° 15' S., 28° 45' E.
 Kasongo.—4° 20' S., 26° 25' E.
 Kassai (River).—3°–11° 30' S., 16° 30'–22° 20' E.
 Kassongo.—4° 30' S., 26° 40' E.
 Katala.—6° S., 12° 45' E.
 Katchinoa.—Abyssinia.
 Kavirondo Bay.—0° 20' S., 34° 30' E.
 Keiga Tummero.—Anglo-Egyptian Sudan.
 Kenhardt.—29° 15' S., 21° 10' E.
 Kenia (Mountain).—0° 20' S., 37° 25' E.
 Kentani.—32° 30' S., 28° 20' E.

- Keren.—15° 45' N., 38° 30' E.
 Kete.—7° 55' N., 0° 10' E.
 Kgokamp.—Perhaps Kgokong, Kalahari.
 Kgokong.—24° 15' S., 23° E.
 Khakhea.—24° 40' S., 23° 25' E.
 Khartum.—15° 40' N., 32° 35' E.
 Khor Arbat.—See Chor Arbat.
 Khor Attar.—9° 55'–10° 25' N., 35°–36° 25' E.
 Khor el Affin.—Sudan.
 Kibara.—1° 50' S., 30° 20' E.
 Kibonoto.—3° 15' S., 37° 10' E.
 Kibwezi.—2° 25' S., 37° 55' E.
 Kidada.—Belgian Congo.
 Kifuku Province.—Belgian Congo.
 Kihuhui.—5° 15' S., 38° 40' E.
 Kikengo.—Usegua.
 Kikoka.—10° 15' S., 30° 15' E.
 Kikuyu.—1° 15' S., 36° 45' E.
 Kilimanjaro (Mountain).—3° S., 37° 20' E.
 Kimberley.—28° 45' S., 24° 45' E.
 Kimuenza.—4° 25' S., 15° 20' E.
 Kinchassa.—4° 20' S., 15° 20' E.
 Kindia.—10° N., 12° 45' W.
 Kindu.—3° S., 26° E.
 Kingoyi.—5° S., 14° E.
 Kisala.—3° 45' S., 28° 10' E.
 Kisantu.—5° 10' S., 15° 10' E.
 Kissidougou.—9° N., 10° 10' W.
 Kisumo.—0° 5' S., 34° 45' E.
 Kitta.—5° 20' S., 14° 40' E.
 Klein Popo.—6° 15' N., 1° 32' E.
 Klerksdorp.—26° 50' S., 26° 35' E.
 Knapdaar.—Cape Colony.
 Koba.—Near Wadelai, Uganda.
 Komati (River).—25° 30'–26° 10' S., 30°–32° E.
 Konakry.—9° 25' N., 13° 45' W.
 Kondoia.—6° 50' S., 37° E.
 Kondue.—4° 55' S., 23° 15' E.
 Kooa.—24° 50' S., 24° 25' E.
 Korarak.—Sudan.
 Kor Attar.—See Khor Attar.
 Kordofan.—12° 25' N., 31° 15' E.
 Kosi Bay.—27° 5' S., 32° 45' E.
 Kotonou.—6° 20' N., 2° 25' E.
 Kottouki.—Abyssinia.
 Krambonambi.—Zululand.
 Krantsvogelkuil.—South Africa.
 Kratje.—7° 40' N., 0° 15' E.
 Krebedje.—5° 55' N., 19° E.
 Kribi.—3° N., 10° E.
 Kuibis.—26° 40' S., 16° 50' E.
 Kunabembe (District).—2° 30'–3° 20' N., 14° 30'–15° 30' E.
 Kundelungu (Mountains).—8° 45'–10° 30' S., 27° 30'–28° E.
 Kunga.—5° 55' S., 12° 35' E.
 Kunungu.—Belgian Congo.
 Kuruman.—27° 25' S., 23° 25' E.
 Kvambonambi.—Zululand.
 Kwamouth.—3° 10' S., 16° 5' E.
 Kware (River).—Kilimandjaro.
 Lady Grey.—33° 55' S., 19° 50' E.
 Ladysmith.—28° 30' S., 29° 45' E.
 Laga (River).—6° 45' N., 41°–42° E.
 Laghouat.—33° 45' N., 2° 50' E.
 Lagos.—6° 30' N., 3° 25' E.
 Laingsburg.—33° 10' S., 20° 55' E.
 Lake Albert.—1° 10'–2° 15' N., 30° 30'–31° 30' E.
 Lam Berene.—0° 35' S., 10° 15' E.
 Landana.—5° 15' S., 12° 15' E.
 Leboi.—Somaliland.
 Lebombo Mountains.—24°–27° S., 32° E.
 Ledzie.—Transvaal.
 Lehututu.—23° 55' S., 21° 55' E.
 Lemba (River).—5° 20'–5° 40' S., 12° 30'–12° 45' E.
 Leopoldville.—4° 25' S., 15° 20' E.
 Letsitele.—Transvaal.
 Lewa.—5° 20' S., 38° 45' E.
 Leydsdorp.—24° S., 30° 30' E.
 Libenge.—3° 35' N., 18° 30' E.
 Libreville.—0° 25' N., 9° 25' E.
 Lichtenburg.—26° 10' S., 26° 10' E.
 Likone.—4° 5' S., 39° 40' E.
 Limpopo (River).—22° 15'–26° S., 26° 45'–33° 20' E.
 Lolodorf.—3° 15' N., 10° 40' E.
 Lome.—6° 5' N., 1° 15' E.
 Long Island.—Seychellen Islands.
 Lookaneng.—Kalahari.
 Los (Island).—9° 25' N., 13° 25' W.

- Louis Trichardt.—23° 10' S., 30° 15' E.
 Lovat.—Orange Free State.
 Luapula (River).—9°–12° S., 29° E.
 Luazomela (River).—Near Guaso Nyire north of Kenia, British East Africa.
 Luanga (River).—12°–14° 30' S., 26° 15' E.
 Luderitz Bay.—26° 40' S., 15° 10' E.
 Luebo.—5° 25' S., 21° 25' E.
 Lukolela.—1° S., 17° 5' E.
 Lukula.—5° 25' S., 13° E.
 Luluabourg.—6° S., 22° 15' E.
 Lumbulumbu.—Stanleyville Region, Belgian Congo.
 Lumbwa.—0° 40' S., 35° 20' E.
 Lunda.—22° 15' S., 30° 5' E.
- Madeira Islands.—33° N., 17° W.
 Madschame.—3° 10' S., 37° 20' E.
 Madzia District.—Belgian Congo.
 Magaliesberg (Mountains).—25° 30'–25° 50' S., 27°–28° E.
 Maggio.—Eritrea.
 Magulumane.—Stanleyville Region, Belgian Congo.
 Magut.—Natal (upper Mkuze R.).
 Mahal-Uonz.—Abyssinia.
 Mahe (Island).—4° 30' S., 55° 30' E.
 Majunga.—15° 35' S., 46° E.
 Makanga.—3° 40' S., 25° 50' E.
 Makesia.—Belgian Congo.
 Malanga.—9° 35' S., 16° 25' E.
 Malela.—6° S., 12° 40' E.
 Malmesbury.—33° 30' S., 18° 50' E.
 Mamou.—10° 20' N., 12° 15' W.
 Manda (Island).—2° 20' S., 40° 55' E.
 Manderston.—Natal.
 Manjara See.—3° 25'–3° 45' S., 35° 40'–35° 50' E.
 Manyema.—Congo.
 Marico.—24° 20'–25° 15' S., 25° 55'–26° 25' E.
 Marzo.—Zululand.
 Maseru.—29° 20' S., 27° 25' E.
 Massai (Region).—0°–6° S., 34°–38° E.
 Matadi.—5° 50' S., 13° 35' E.
 Matele.—French Congo.
 Matombi.—Stanleyville Region, Belgian Congo.
- Mauda.—French Congo.
 Mauritius (Island).—20° S., 57° 30' E.
 Mawambi.—1° 10' N., 28° 45' E.
 Mayabel.—Erythrea.
 Mayombe.—5° S., 13° E.
 Mbazwane (Swamp).—Northern Zululand.
 Mbonge.—4° 35' N., 8° 10' E.
 M'bugga.—Kawende.
 Mbusini.—6° 15' S., 38° E.
 Mbuyuni.—3° 30' S., 37° 55' E.
 Medje.—2° 25' N., 27° 30' E.
 Meru (Mountain).—3° 15' S., 36° 45' E.
 Messina.—22° 20' S., 29° 45' E.
 Meukelneuk Hill.—Pretoria, South Africa.
 Mfolosi.—28° 25' S., 32° 15' E.
 Mhlazinga.—Zululand.
 Middelburg.—31° 30' S., 25° E.
 Misahohe.—6° 55' N., 0° 35' E.
 M'karamo.—5° S., 38° 7' E.
 Mkosi (Hill).—28° 3' S., 32° 13' E.
 Mkosi (Lake).—26° 45' S., 27° E.
 M'kullo.—Eritrea.
 Mlandje Berge.—16° 5' S., 35° 45' E.
 Moanda.—5° 50' S., 12° 20' E.
 Modder River Rail.—29° S., 24° 30' E.
 Mokeetse.—23° 35' S., 30° 5' E.
 Molundu.—2° 5' N., 15° 15' E.
 Mombasa.—4° S., 39° 50' E.
 Mombo.—4° 55' S., 38° 15' E.
 Mongalla.—5° 10' N., 31° 45' E.
 Mongende.—Belgian Congo.
 Monrovia.—6° 30' N., 10° 50' W.
 Montagu Pass.—33° 45' S., 22° 30' E.
 Morogoro.—6° 50' S., 37° 50' E.
 Morumballe (Mountains).—Zambesi River, Portuguese East Africa.
 Moschi.—3° 20' S., 37° 25' E.
 Moto.—Belgian Congo, Uele River.
 Mount Edgecombe.—29° 40' S., 30° 55' E.
 Mphome.—Northern Transvaal.
 M'puapua.—6° 15' S., 36° E.
 Mseleni.—Zululand.
 Mtetwa.—28° 30' S., 32° 1' E.
 Mtewa.—See Mtetwa.
 M'tougui.—Marocco.
 Mtunzini.—Zululand.
 Muckleneuk (Hill).—Near Pretoria.

- Mudén.—29° S., 30° 25' E.
 Mukimbungu.—5° S., 14° E.
 Mulder's Vlei.—33° 50' S., 18° 50' E.
 Mundame.—4° 35' N., 9° 35' E.
 Mungo (River).—4° 4' 50' N., 9° 30' E.
 Murraysburg.—31° 55' S., 23° 45' E.
 Muza-Thal.—Zambesi.
 Myombo.—Tanganyika Territory.
- Naboomspruit.—24° 20' S., 28° 45' E.
 Nairobi.—1° 5' S., 36° 50' E.
 Naivasha.—0° 40' S., 36° 35' E.
 Namukunde.—Ovamboland.
 Ndian.—5° N., 8° 50' E.
 Nduma.—South of Lake Inyomite.
 Nefasit.—15° 25' N., 39° E.
 Nelspruit.—25° 25' S., 30° 45' E.
 Neudamm.—22° 25' S., 17° 20' E.
 New Hanover.—29° 20' S., 30° 35' E.
 New-Moschi.—3° 20' S., 37° 20' E.
 Ngare-na-Nyuki (River).—3° 3' 15' S., 36° 55' E.
 Ngayu.—1° 40' N., 27° 40' E.
 N'Goko.—2° N., 15° 30' E.
 Niagara.—3° 40' N., 26° 50' E.
 Niapu.—2° 20' N., 26° 45' E.
 Nibele.—27° 50' S., 32° 25' E.
 Nieudorp.—12° 5' S., 27° 50' E.
 Nkoka.—17° 45' S., 28° E.
 Nkulukuku.—Uganda.
 Nobelsfontein.—Middle Area, South Africa.
 Nola.—3° 32' N., 16° E.
 Nossi-Be (Island).—15° 50' S., 47° 45' E.
 Ntete.—Belgian Congo.
 Nubbaka.—Sudan.
 Nyambo.—Usambara.
 Nyangwe.—4° 15' S., 26° 15' E.
 Nyassa.—9° 30'–17° 20' S., 32° 30'–36° E.
 Nylstroom.—24° 35' S., 28° 25' E.
- Oban.—5° 20' N., 8° 35' E.
 Obswe.—Belgian Congo.
 Ogowe (River).—1° S., 10° E.
 Okahandja.—22° S., 16° 55' E.
 Okasise.—21° 52' S., 16° 30' E.
 Okosongomingo.—20° 40' S., 17° 8' E.
 Old Calabar.—5° N., 8° E.
- Olivewood.—Cape Province, South Africa.
 Olokemeje.—7° 25' N., 3° 30' E.
 Onjatu Farm.—21° 35' S., 17° 40' E.
 Oriel (Mountain).—Sierra Leone.
 Orlog (River).—Capeland.
 Otjimbingve.—22° 22' S., 16° 8' E.
 Otjituezu.—22° 20' S., 17° 25' E.
 Otjosondyombo.—Perhaps Otjosondu.—21° 15' S., 17° 50' E.
 Ourso.—Abyssinia.
 Outjo.—20° 5' S., 16° 10' E.
- Paarl.—33° 45' S., 18° 25' E.
 Pasaconde.—Near Zambézi, Belgian Congo.
 Pearston.—32° 30' S., 25° 10' E.
 Peddie.—33° 10' S., 27° 10' E.
 Pemba (Island).—4° 50'–5° 30' S., 39° 40'–39° 50' E.
 Penge.—1° 25' N., 27° 50' E.
 Phitshane.—Kalahari.
 Picounda.—French Congo.
 Pienaars River Rail.—25° 10' S., 28° 15' E.
 Pietermaritzburg.—29° 35' S., 30° 25' E.
 Pietersburg.—23° 50' S., 29° 25' E.
 Pietpotgietersrust.—24° 10' S., 29° E.
 Pinetown.—29° 45' S., 30° 50' E.
 Platrand.—Transval.
 Poivre (Island).—5° 45' S., 53° E.
 Poko.—3° 10' N., 26° 50' E.
 Pondweni.—27° 45' S., 32° 30' E.
 Port Alfred.—33° 35' S., 27° E.
 Port Elizabeth.—34° S., 25° 35' E.
 Port Florence.—0° 5' S., 34° 45' E.
 Port Natal.—See Durban.
 Port Sudan.—19° 35' N., 37° 5' E.
 Praslin (Island).—4° 15' S., 56° E.
 Pretoria.—25° 40' S., 28° 15' E.
 Priel Mission Station.—Griqualand West.
 Prieska.—29° 40' S., 22° 42' E.
 Principe (Island).—1° 40' N., 7° 25' E.
 Prunes (Island).—East Madagascar.
 Pyramids.—25° 35' S., 28° 15' E.
- Quifangondo.—8° 45' S., 13° 20' E.
 Quillimane.—17° 45' S., 37° E.

Rehoboth.—23° 20' S., 16° 5' E.
 Reitkuil.—Orange Free State.
 Renk.—11° 45' N., 32° 45' E.
 Richmond.—29° 50' S., 30° 15' E.
 Rio Cassini.—11° 10' N., 15° W.
 Rohan-Chabot Mission.—Angola.
 Rostenburg.—Probably Rusenburg,
 Transvaal.
 Roughetti.—Abyssinia.
 Ruwenzori (Mountain).—0° 30' N., 29°
 50' E.
 Sabarguma.—Eritrea.
 San Antonio.—6° 10' S., 12° 25' E.
 St. Benoit.—Belgian Congo.
 St. Francis Bay.—34° S., 25° E.
 St. Gabriel.—Stanleyville Region, Bel-
 gian Congo.
 St. Paul de Loanda.—8° 55' S., 13° 10' E.
 St. Louis.—16° N., 16° 35' W.
 Ste. Marie de Morovoay.—17° S., 50° E.
 Salem.—22° 40' S., 15° 25' E.
 Salisbury.—17° 45' S., 31° E.
 Salsola.—Namaland.
 Sampwe.—9° 30' S., 27° 25' E.
 San Antonio.—6° 10' S., 12° 25' E.
 San Benito (River).—1° 35' N., 9° 35' E.
 Sancurar.—4° N., 40° E.
 Sangmelima.—2° 50' N., 11° 55' E.
 Sankisia.—9° 30' S., 25° 55' E.
 Sankuru (River).—4°–10° S., 21°–22° E.
 San Nicolas.—Rio Do Ouro.
 San Thomé (Island).—0° 20' N., 6° 43' E.
 Sapele.—5° 55' N., 5° 45' E.
 Schoombie.—31° 25' S., 25° 30' E.
 Scioa.—10° N., 39° 30' E.
 Scottburgh.—30° 20' S., 30° 40' E.
 Segboroué.—Dahomey.
 Sekgoma.—24° 30' S., 23° 50' E.
 Selati (River).—23° 50'–24° 10' S., 30°
 15'–31° 5' E.
 Senegambina.—Probably Sangmelima.
 Sennar.—13° 30' N., 33° 35' E.
 Sesse (Island).—0° 25' S., 32° 30' E.
 Setit (River).—14° 20' N., 35° 50'–37°
 20' E.
 Sett.—Damara.
 Severelela.—24° 55' S., 24° 55' E.

Shari-Chad (Lake).—See Chari Tchad
 (Lake).
 Sherbro (Island).—7° 25' N., 12° 45' W.
 Shimoni.—4° 35' S., 39° 15' E.
 Sibayi (Lake).—27° 20' S., 32° 45' E.
 Silhouette (Island).—4° 20' S., 55° E.
 Simondium.—33° 50' S., 19° E.
 Slievre.—Natal.
 Sobat.—8°–9° 10' N., 31° 30'–33° E.
 Sofara.—Upper Senegal.
 Sokoto.—13° N., 5° 10' E.
 Somba.—15° 15' S., 35° 20' E.
 Somkele.—28° 15' S., 32° 5' E.
 Sordwana (Bay).—Zululand.
 Springbok.—29° 40' S., 17° 55' E.
 Stanford Hill.—Near Durban, Natal.
 Stanley Falls.—0° 35' N.—0° 20' S., 25°
 15'–25° 40' E.
 Stanleyville.—0° 30' N., 25° 15' E.
 Steinkopf.—29° 15' S., 17° 45' E.
 Stellenbosch.—33° 55' S., 18° 50' E.
 Steynsburg.—31° 20' S., 25° 50' E.
 Suali.—Belgian Congo.
 Sweatwaters.—Near Pietermaritzburg,
 Natal.
 Table Mountain.—34° S., 18° 25' E.
 Talodi.—10° 45' N., 30° 25' E.
 Tamatave.—18° S., 49° 15' E.
 Tananarivo.—18° 45' S., 48° 30' E.
 Tanga.—5° 5' S., 39° 5' E.
 Tanger.—35° 45' N., 5° 55' W.
 Taveta.—3° 25' S., 37° 45' E.
 Tchafianani.—Abyssinia.
 Tete.—16° 10' S., 33° 30' E.
 Tha'banchu.—29° 10' S., 26° 55' E.
 Theben.—25° 45' N., 32° 35' E.
 Theka (River).—1° S., 37° E.
 Thies.—14° 45' N., 16° 15' W.
 Three Sisters.—31° 47' S., 23° 5' E.
 Thysville.—5° 30' S., 15° E.
 Tigre.—12°–14° 30' N., 38°–40° E.
 Tongaat.—29° 25' S., 31° 10' E.
 Toukoto.—French Sudan.
 Transkei (Region).—32°–33° S., 27°–29°
 E.
 Trappes Valley.—Cape Province, South
 Africa.

- Tshela.—5° S., 13° E.
 Tsumeb.—19° 15' S., 17° 44' E.
 Tulear.—23° 45' S., 43° 50' E.
 Tumbwe.—Belgian Congo.
 Tylden.—32° 10' S., 27° 5' E.
 Tzaneen.—23° 30' S., 30° 25' E.
- Uadi M'bellem.—North Africa.
 Ubangi (River).—0°–5° N., 18°–23° E.
 Ubusini.—Perhaps Mbusini.—6° 15' S., 38° E.
 Uele (River).—3° 30' N., 25°–30° E.
 Ukuzi (River).—Zululand.
 Ulundi.—28° 25' S., 31° 30' E.
 Umangi.—2° 10' N., 21° 25' E.
 Umbeluzi (River).—26° 10'–26° 15' S., 31°–32° E.
 Umfolosi.—28° 25' S., 32° 15' E.
 Umkomati.—On Delagoa Bay.
 Uomber.—Abyssinia.
 Usambara.—5° 50' S., 38° 40' E.
 Usutu (River).—26° 35'–26° 55' S., 30° 50'–32° 20' E.
- Vaal (River).—26° 15'–29° S., 23° 40'–30° 15' E.
 van Rhysdorp.—31° 35' S., 18° 40' E.
 Ventersburg.—28° 5' S., 27° 5' E.
 Verulam.—29° 35' S., 31° E.
 Victoria.—4° N., 9° 15' E.
 Victoria East.—33° S., 27° E.
 Victoria Nyanza.—0° 10' N.–2° 45' S., 32°–34° E.
 Victoria West.—31° 30' S., 23° E.
 Vierfontein.—27° S., 26° 45' E.
 Villa Fontes.—Zambesi.
 Volta (River).—6°–12° 45' N., 5° W.–0° 45' E.
 Vrijburg.—26° 55' S., 24° 35' E.
- Wadelai.—2° 45' N., 31° 45' E.
- Wad Medani.—14° 25' N., 33° 30' E.
 Wanga.—4° 40' S., 39° 15' E.
 Warmbaths.—24° 50' S., 28° 20' E.
 Waterval Onder.—25° 40' S., 30° 25' E.
 Weenen (District).—28° 50' S., 30° 5' E.
 Welgelegen.—12° S., 27° 45' E.
 Wellington.—33° 40' S., 19° E.
 Westphalia.—Near Duivels Kloof.
 Willowmore.—33° 20' S., 23° 30' E.
 Windhoek.—See Windhuk.
 Windhuk.—22° 35' S., 17° 10' E.
 Winkelspruit.—Natal.
 Winterton.—28° 50' S., 29° 30' E.
 Witbank.—25° 50' S., 29° 10' E.
 Wolfdoon.—South Africa (Bushman-land).
 Wolftoon.—See Wolfdoon.
 Woodbush.—24° S., 29° 55' E.
- Xinavane.—25° 10' S., 32° 35' E.
- Yaba.—Abyssinia.
 Yaba.—South Nigeria.
 Yakoma.—Congo.
 Yakuluku.—4° 20' N., 28° 50' E.
 Yambata.—2° 20' N., 22° 5' E.
 Yaunde.—3° 50' N., 11° 35' E.
- Zambesi (River).—11° 5'–18° 45' S., 22° 35'–36° 15' E.
 Zambeti.—South Africa.
 Zambi.—6° S., 12° 50' E.
 Zand (River).—25° 5'–25° 40' S., 27° 30'–28° 5' E.
 Zanzibar (Island).—6° S., 39° 30' E.
 Zinder.—13° 45' N., 8° 50' E.
 Zomba.—15° 20' S., 35° 20' E.
 Zuurberg (Mountain).—31° 10' S., 25° 30'–26° E.
 Zwartkops.—33° 46' S., 25° 35' E.

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PLATES XX TO XXXVIII

PLATE XX

Black earth tunnels occupied by a yellowish termite *Rhinotermes* (*Schedorhinotermes lamanianus* var. *angulatus*, new variety, on the trunk of a large tree, at Niapu, November 7, 1913. Near the top and to the right is a large accumulation which is probably the nest of a species of *Nasutitermes*.



PLATE XXI

Nest of *Acanthotermes* (*Pseudacanthotermes*) *spiniger* (Sjöstedt), at Avakubi, October 22, 1909.

Fig. 1. The enormous hills built by these termites at Avakubi sometimes reach a height of 13 feet 3 inches above the surface of the ground, and a greatest width of 56 feet. They are usually started at the base of a bush or tree, the lower part of which is soon completely surrounded. With the exception of the cones at the top, the largest of which measured 4 feet 5 inches, these hills are covered with vegetation.

Fig. 2. Cone of termite hill, showing how the forest natives surround it with broad leaves in order to collect the winged individuals more easily at the swarming season. These insects are highly prized as delicacies. The "cap" of leaves over the top of the nest and the side pocket from which the termites are scooped have been removed to show how the layers of these impermeable, green, marantaceous leaves are arranged.



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PLATE XXII

Section of mushroom garden of *Acanthotermes* (*Pseudacanthotermes*) *militaris* (Hagen) from a termitarium opened at Malela, July 6, 1915. This portion of the nest was about a foot and a half below the surface of the ground. The top of the hill, in the form of a low, rather smooth mound, protruded only about a foot and a half above the surface of the ground. The tiny white spots are the mushrooms on which the termites feed their young. A minute ant, *Pædalqus termitolestes* Wheeler, had established its nest close to the surface in the upper part of the termitarium (upper right hand corner). *Termes* (*Termes*) *malelaensis*, new species, also was found in this nest.

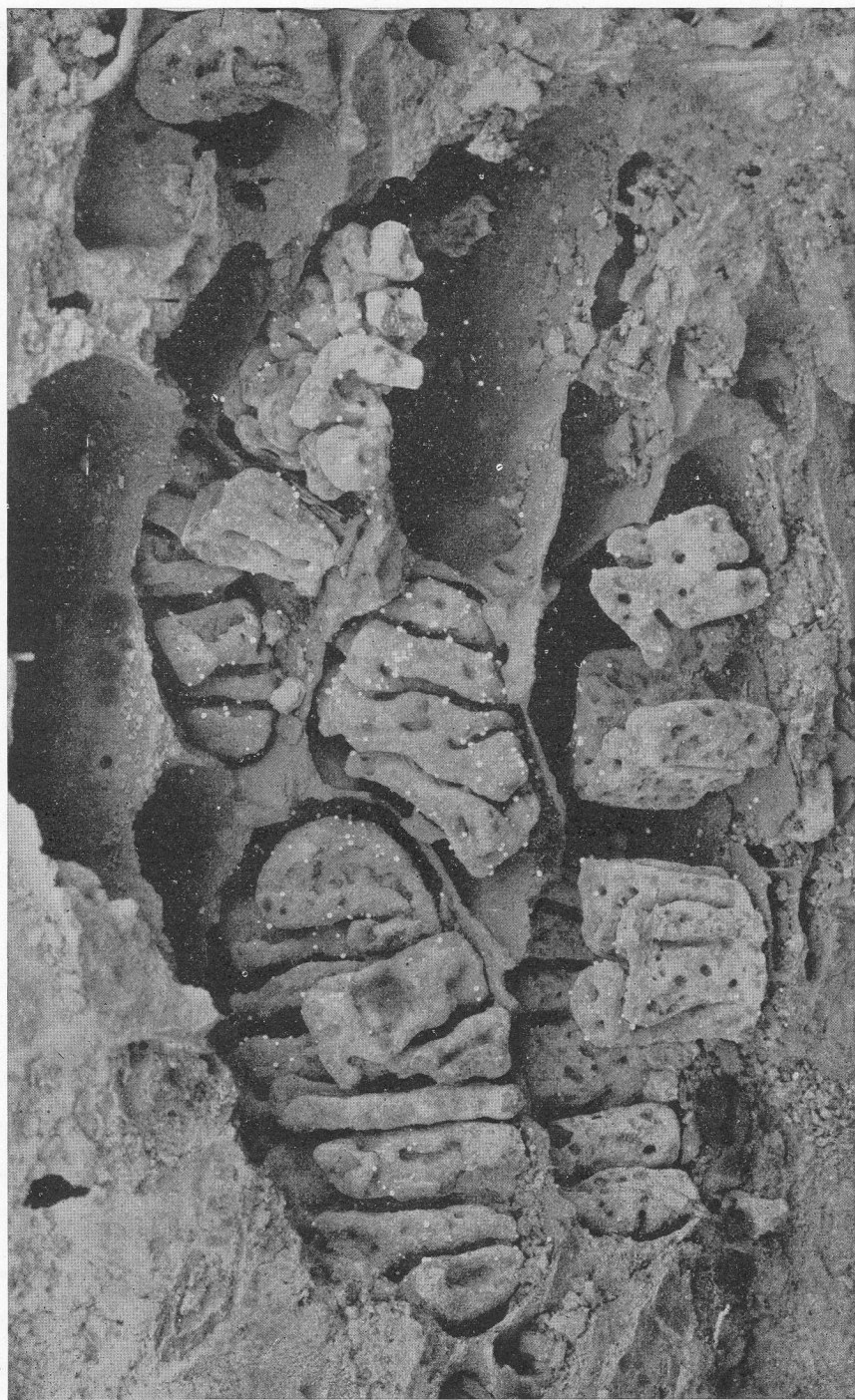
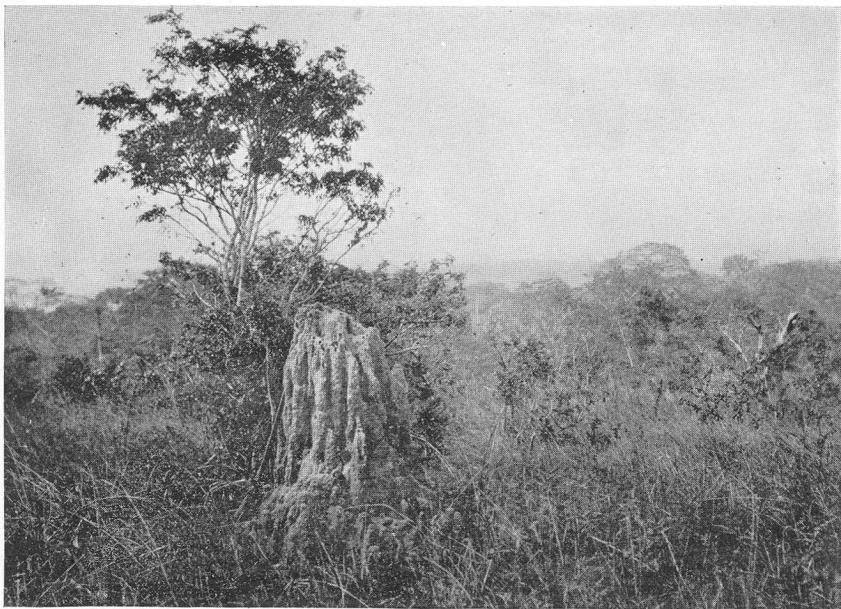


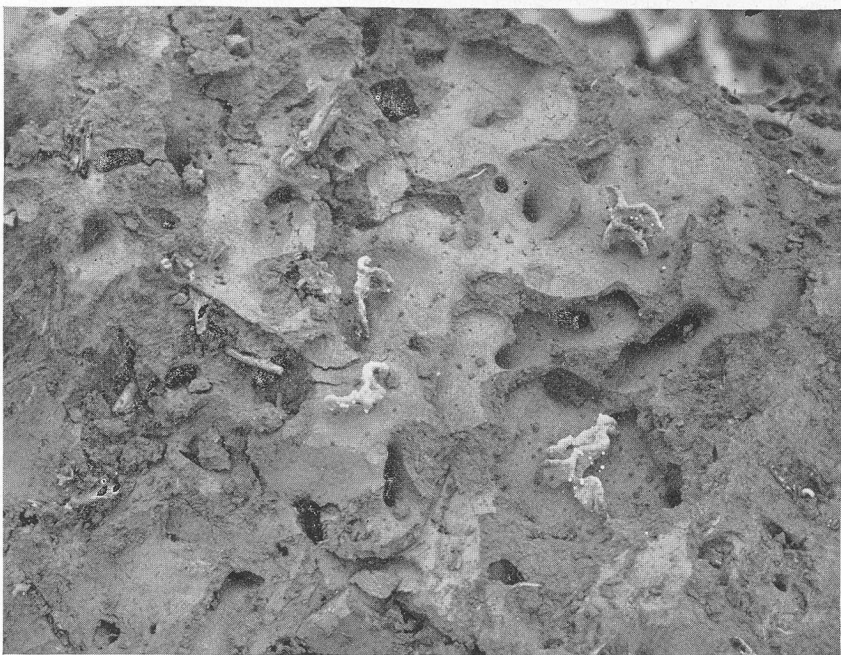
PLATE XXIII

Fig. 1. Nest of *Macrotermes* (*Bellicositermes*) *natalensis* (Haviland) near Kwamouth, July 13, 1909.

Fig. 2. Horizontal section of a cone of a hill built by *Acanthotermes* (*Pseudicanthotermes*) *spiniger* (Sjöstedt) that had been broken off near its base, Avakubi, October 22, 1909. The Photograph shows the various channels and chambers, especially those with fungi-bearing structures in place (Cf. Pl. XXI).



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PLATE XXIV

Tall nest of *Macrotermes* (*Bellicositermes*) *natalensis* (Haviland) at Kwamouth, July 14, 1909. In Africa, termite nests often attain huge proportions, some with spires as high as twenty feet. In certain cases they give the landscape the effect of hill formation.

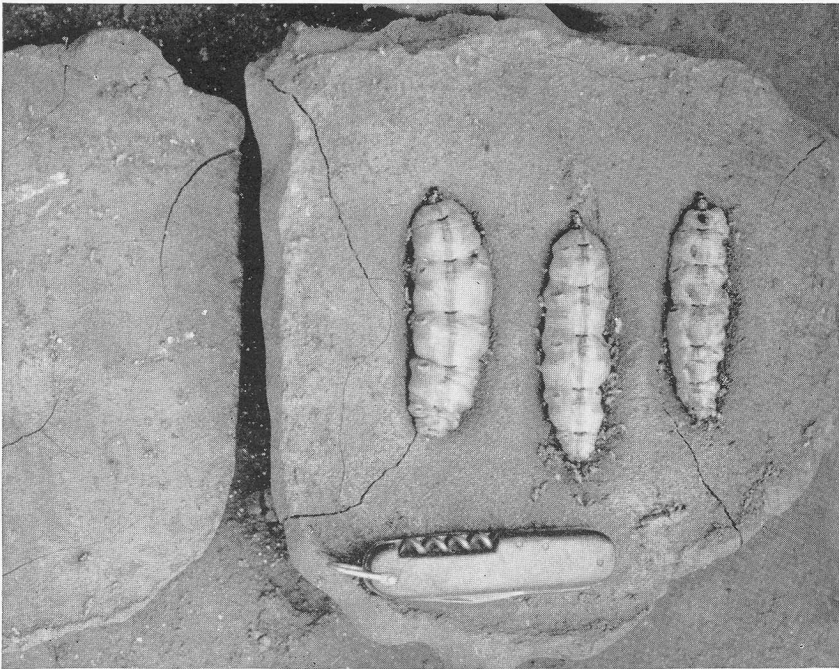


PLATE XXV

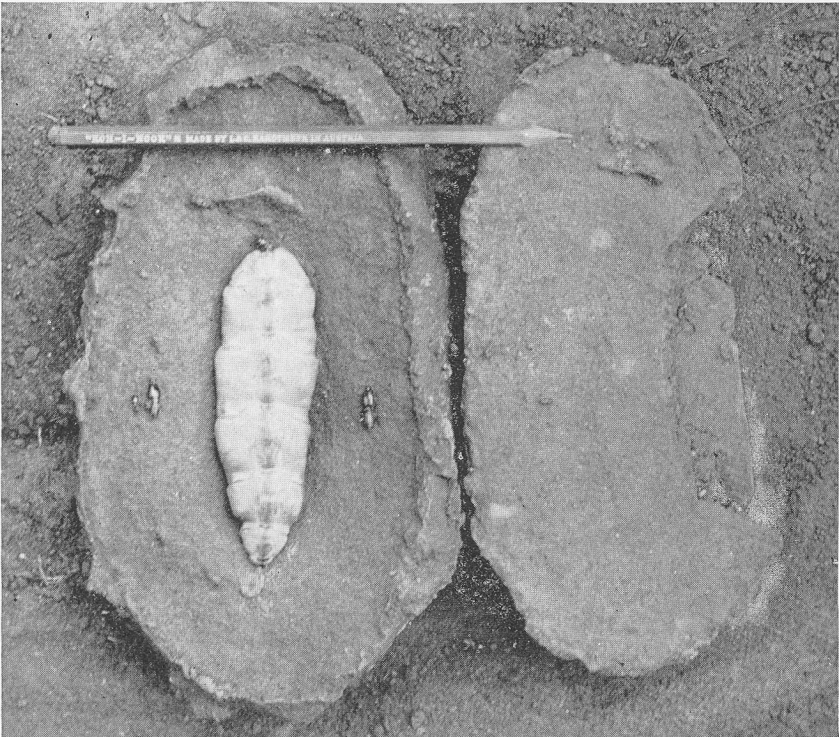
Macrotermes (Bellicositermes) natalensis (Haviland).

Fig. 1. Three termite queens in flattened cell made of compact, slightly moist clay, at Niangara, May, 1913. The hollow space inside the cell measured 220 mm. long and 200 mm. wide. The queens themselves were 75 mm. long. The occurrence of so many queens in one chamber is rather unusual, there generally being but one. It is usually believed that termitaria of this species contain only one queen, situated somewhere near the base, slightly above or below the surface of the ground. But in larger nests as many as a dozen different royal chambers have been found. These cells containing queens are always located a certain distance from the outer surface, as it is apparently of great importance to keep them from being affected by climatic changes.

Fig. 2. Termite queen, 101 mm. long, in chamber 214 mm. long and 114 mm. wide, at Faradje, January, 1913.



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PLATE XXVI

Landscape in the savannah country near Niangara, May 10, 1913, showing numerous hills of *Macrotermes* (*Bellicositermes*) *natalensis* (Haviland) scattered over an almost treeless grass plain. During the rainy season the portions between hills are inundated and termite structures are really built above water-level, giving the landscape its hillocky aspect.

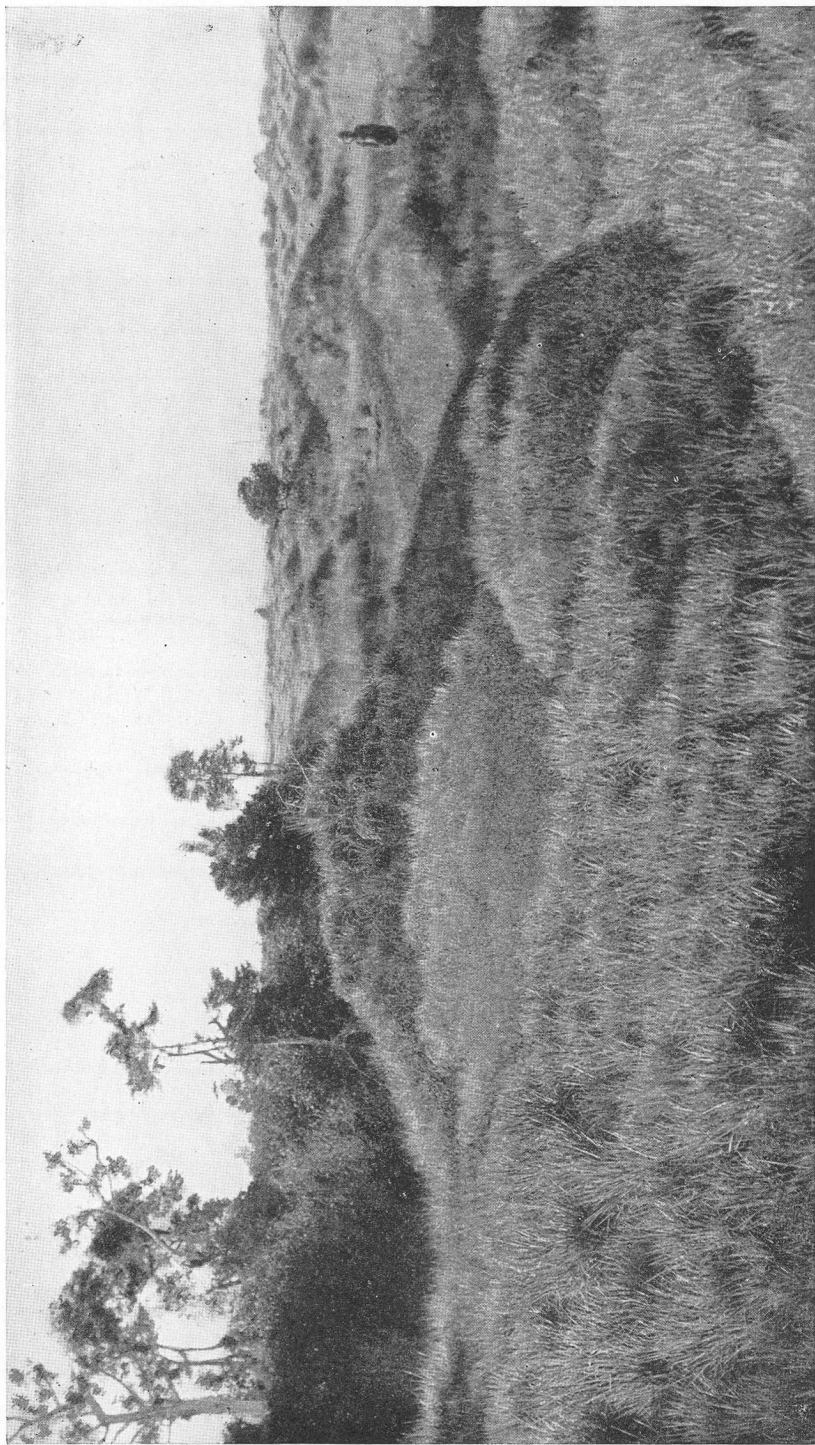
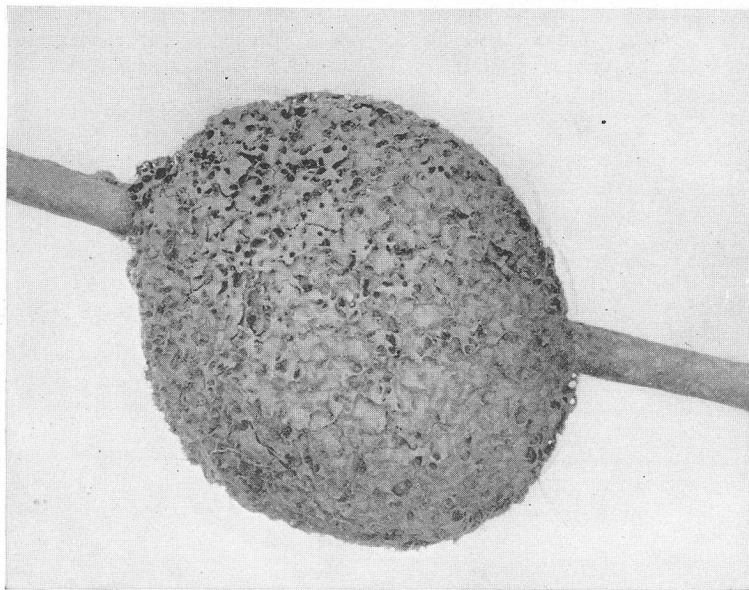


PLATE XXVII

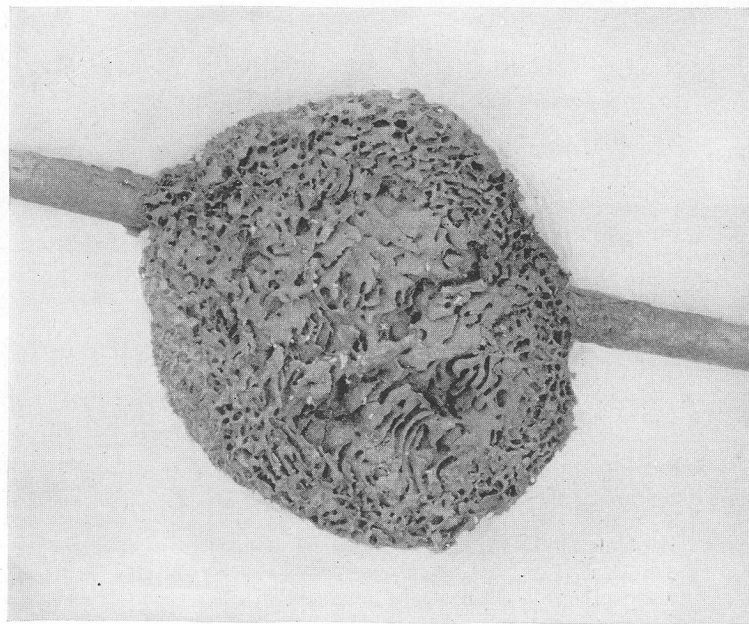
Nest of *Nasutitermes* (*Nasutitermes*) *santschii*, new species, at Medje, June, 1914.

Fig. 1. Nest with outer covering broken away. Such carton structures are commonly found in the forest around trees or bushes, often close to the ground, but also at considerable height. They are always surrounded by a rough, thin, very fragile waterproof shell which prevents rain from entering the cells although it is attached rather loosely.

Fig. 2. Section of the same. Usually when parts of termite nests are destroyed the open cells are repaired at once.



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PLATE XXVIII

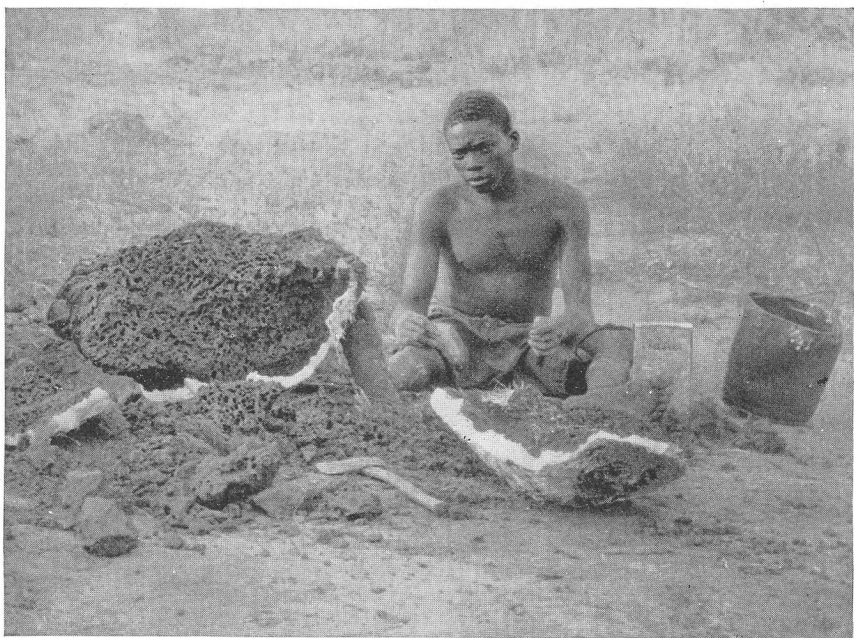
Nest of *Nasutitermes* (*Trinervitermes*) *carbonarius* (Sjöstedt), near Faradje, January, 1912.

Fig. 1. These small termite structures occur chiefly on bare ground or near pathways in the savannah country. Very often they are built around the base of small green bushes. They are common near the open spaces around the wallowing places of the square-lipped rhinoceros (*Ceratotherium simum cottoni*) in the Uele district.

Fig. 2. Part of the internal structure of the nest can be seen from the portion still adhering to the plaster cast which was made in order to insure a perfect reproduction for a habitat group.



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PLATE XXIX

Nests of *Mirotermes* (*Cubitermes*) *subarquatus* Sjöstedt, on tree trunks.

Fig. 1. Near Lubila, September 20, 1909.

Fig. 2. Section of same.

Fig. 3. At Medje, April, 1914.

These nests show an adaptation of the mushroom-shaped structures so common in the savannah country (Pl. XXX) to the forest region, and are generally fastened in semi-circular fashion, one above another, to the trunks of trees. The partly hollow points at the lower edge of each section seem to serve the same purpose as the prolonged tips on many forest leaves, namely, to shed water more rapidly.



3



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PLATE XXX

Mushroom-shaped nests of *Mirotermes* (*Cubitermes*) *loubetsiensis* Sjöstedt, at Medje, June, 1914.

Fig. 1. This capped structure common in the forest had a total height of 44 cm., diameter across the top of 27 cm., and width across the middle of the stem of 13 cm.

Fig. 2. Section of same. Small round holes are distinctly visible in some of the cells. They serve as the only passage from one cell to another. In case of injury to the termitarium one can see how easily they are blocked by the head of a single soldier. In this nest the queen was located just above the stalk that serves as support, and appears as a white mass in the cell near the center where the termitarium widens.



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PLATE XXXI

Fig. 1. Mushroom-shaped nest of *Mirotermes* (*Cubitermes*) *sankurensis* Wasmann, at Matadi, June 27, 1909.

Fig. 2. Mushroom-shaped nest of *Mirotermes* (*Cubitermes*) *orthognathus*, new species, near Faradje, February, 1912. The structure to the right is built upon an old one which had been overturned, probably by an elephant. Middle nest shows how top is attached to column. At left, a cross section of the stem. Such termitaria generally occur on moist, sloping ground, often in considerable numbers.



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PLATE XXXII

Fig. 1. Mushroom-shaped nest of *Mirotermes* (*Cubitermes*) *sankurensis* Wasmann, at Matadi, June 27, 1909. The cap is double, the second cover evidently having been added to repair an injury to the first and thus preserve its water-shedding function. Near the right base a small section has been removed to show the cell formation.

Fig. 2. Nest and chevron-shaped tunnels of the small *Mirotermes* (*Procubitermes*) *niapuensis*, new species, on a tree trunk, at Niapu, November 6, 1913. The numerous upward-pointed hollow ridges in all probability serve to drain off the rain and thus protect the nest below.



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PLATE XXXIII

Fig. 1. Nest built by *Mirotermes* (*Cubitermes*) *sankurensis* Wasmann and occupied also by *M. (C.) antennalis*, *Microcerotermes parvus* and *Nasutitermes* (*Trinervitermes*) *bettonianus* subsp. *sulciceps*, at Garamba, July, 1912.

Fig. 2. Dead vegetable matter covered with soil by termites, at Banana. After a rain the cut and dried stalks in this patch were surrounded and covered with fine particles of moist soil by the termites in a single night. The vegetable matter on which they feed is thus considerably softened and the termites are also able to work during day-light under the protection of this cover.



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PLATE XXXIV

Fig. 1. Nest of rich, dark brown soil built by *Microcerotermes fuscotibialis* (Sjöstedt) on a mango tree, with covered passageways leading up and down, at Leopoldville, July 11, 1909.

Fig. 2. Nest of *Microcerotermes fuscotibialis* (Sjöstedt) and *M. edentatus* Wasmann in a coffee bush, at Stanleyville, August 29, 1909. The soil is rather loosely put together and the nest lacks the strength of some carton structures. The many rugosities and points assist much in shedding rain.



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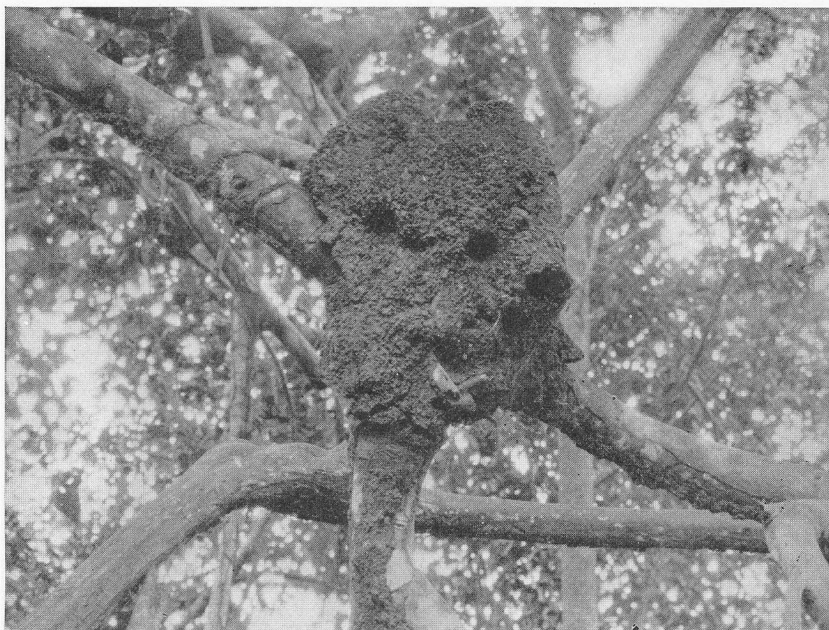
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PLATE XXXV

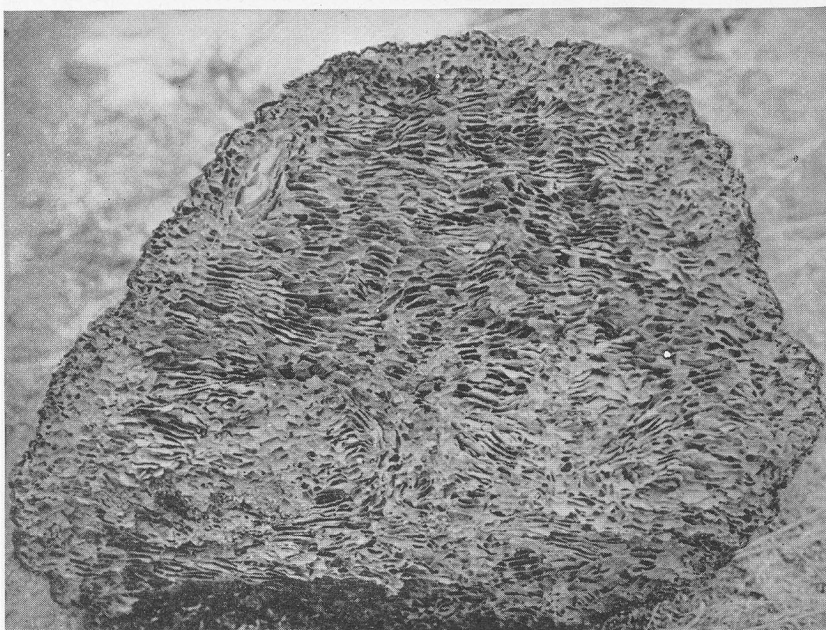
Nest of *Microcerotermes fuscotibialis* (Sjöstedt) near Zambi, June 30, 1915.

Fig. 1. Carton nest located in one of the swamps near the Congo River and about five feet above the ground. The large holes in the nest were evidently made recently by woodpeckers.

Fig. 2. Undoubtedly these nests are enlarged from time to time, with the arrangement of the cells changing considerably, those in the outer layer being much smaller.



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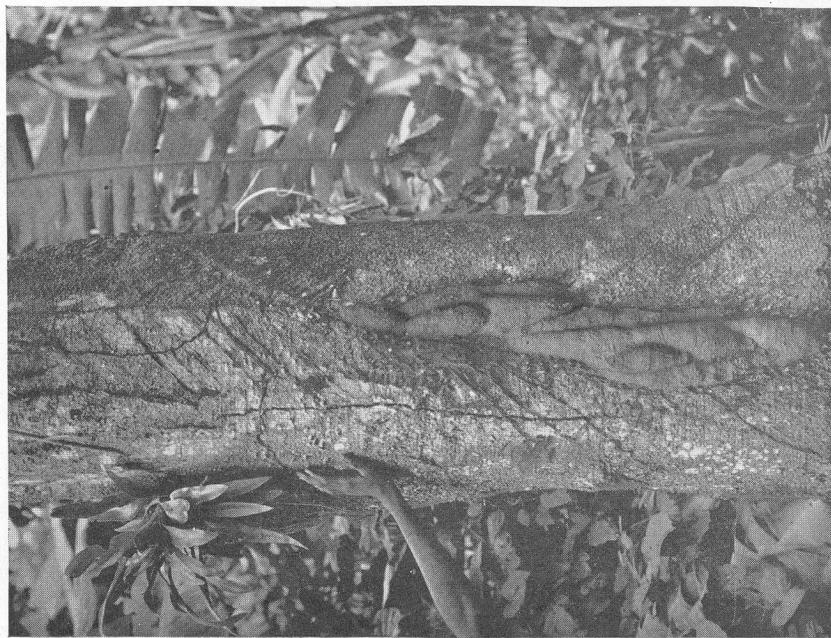
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PLATE XXXVI

Nest of *Microcerotermes progrediens* Silvestri on a tree trunk, at Poko, August, 1913.

Fig. 1. An old nest probably made by *Mirotermes* (*Procubitermes*) *niapuensis*, new species. Notice that the water-shedding ridges are in disrepair.

Fig. 2. Section of same. The hollowness of the water-shedding ridges can be seen in some cases.



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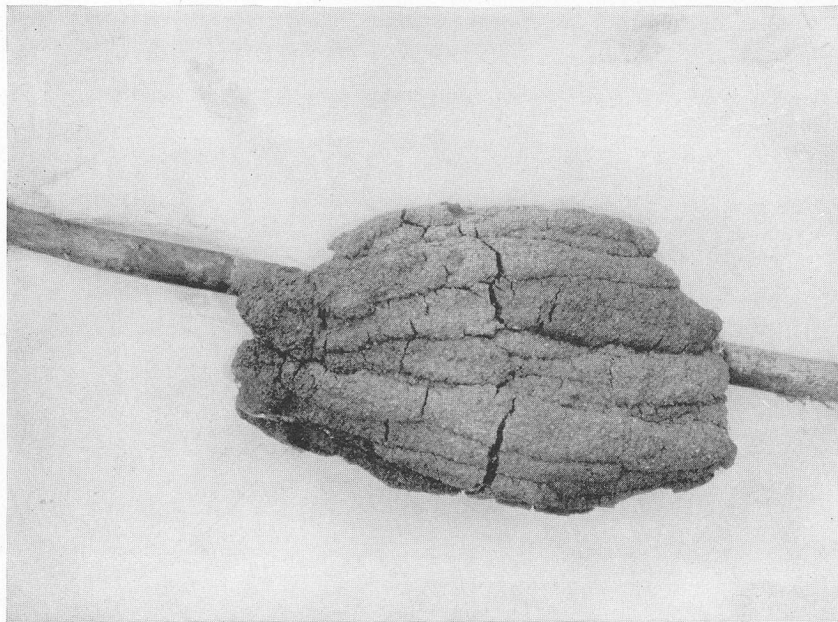
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PLATE XXXVII

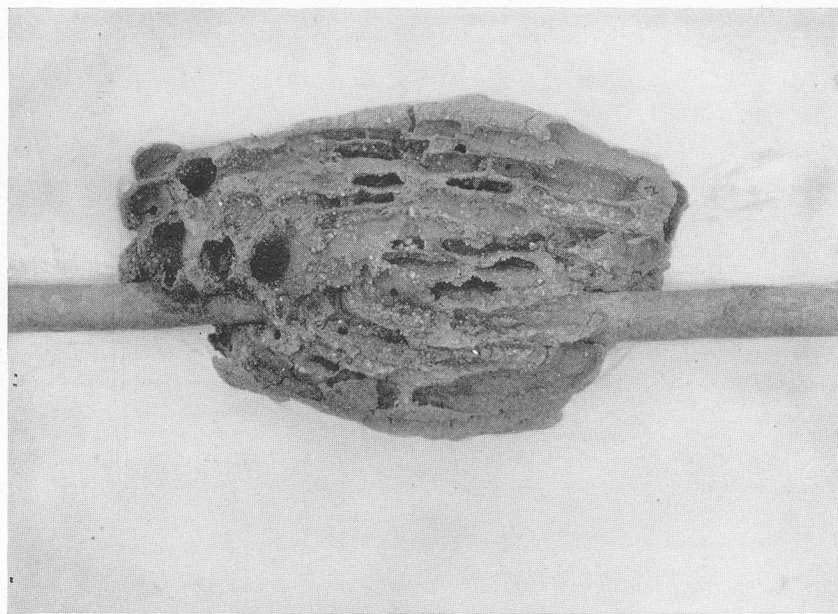
Nest of an unknown termite on a stick close to the ground, at Medje, June , 1914. As no soldiers were found, this nest may belong to a species of *Anoplotermes*.

Fig. 1. This small structure was found on a bush about three feet from the ground, and had a total length of 92 mm. and a width of 55 mm. Although made only a short time before of soft, moist, grayish dirt, it had already cracked due to evaporation. It contained very few workers. A similar structure about the same size was found a few weeks later in like surroundings in the forest near Babeyru.

Fig. 2. Section of same, showing longitudinal cells.



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PLATE XXXVIII

Azande huts in the plains region.

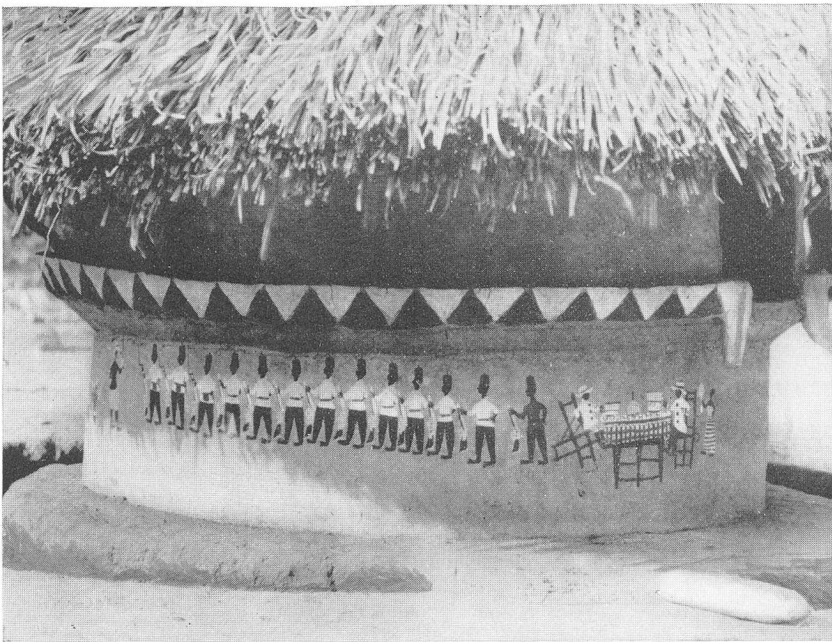
Fig. 1. In the village of Chief Bagboro, near Yakuluku, 1911.

Fig. 2. At Faradje, February, 1913.

To protect their huts from the ravages of termites the natives in the northern Uele district build them on a solid, often decorated base raised 3 or 4 feet above the level of the ground. In this open grass country straight wood needed for building purposes is comparatively scarce, thus causing the natives to be exceptionally careful of their homes. As a further precaution they dig a trench around the huts a slight distance from the base, only a part near the entrance being left as a bridge. These ditches are usually over 12 inches wide and more than 3 feet deep, with perpendicular walls. During the rainy season this forms a regular moat, filling rapidly with water, some of it draining off from the roof. Even in the dry season, with but slight control, this is a fairly effective means of isolating the huts from destruction by white ants. Termites always build their practically waterproof structures above the highest water-level and this is one of the chief reasons why in certain regions the country has such a hillocky aspect (Cf. Pl. XXVI).



1



2

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