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Article I.—ANTS OF THE AMERICAN MUSEUM CONGO EXPEDITION. A CONTRIBUTION TO THE MYRMECOLOGY OF AFRICA[1]

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WITH THE COLLABORATION OF J. BEQUAERT, I. W. BAILEY, F. SANTSCHI, AND W. M. MANN

PLATES I TO XLV, 47 MAPS, AND 103 TEXT FIGURES

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[1]Scientific Results of the American Museum Congo Expedition. Entomology No. 7.

INTRODUCTION

The present volume has grown out of a study of the ants collected by the American Museum Congo Expedition, under the direction of Messrs. Herbert Lang and James P. Chapin, and of a smaller collection made in the same region by Dr. J. Bequaert. The working up of this material has proved to be far from easy, owing to the state of the literature on the African Formicidæ. During the nineteenth century comparatively little work was done on the ants of the dark continent, but during the past two decades, as a result of numerous expeditions and the interest of resident entomologists, Emery, Forel, Santschi, and Arnold, but especially Forel and Santschi, have published a great number of papers dealing with fragments of the Ethiopian fauna. This literature proved to be quite unmanageable until I had carefully catalogued the numerous described species, subspecies, and varieties. After this had been accomplished it seemed best to publish the results as an aid to future students. Getting the catalogue ready for publication, however, was a very annoying task, which I could hardly have undertaken without the assistance of Dr. Bequaert, who patiently verified all the numerous references, added others, and helped in arranging the synonymy and lists of localities. He has also given me the benefit of his expert opinion in regard to many taxonomic details.

Both Mr. Lang and Dr. Bequaert have, in fact, showed such keen and enthusiastic interest in the progress of the work that it seemed advisable to expand it by the addition of other matter of interest not only to the zoologist but to the general public. This, however, required the services of several collaborators. At my request, Dr. F. Santschi kindly undertook to work up the species of *Crematogaster*, a genus to which he has given much attention. A glance at my catalogue of the Ethiopian species will show why I despaired of adequately handling the Congo material of the group. I might have attempted it, if the *Crematogaster* portion of Mr. George Arnold's monograph of the Rhodesian ants had appeared, but the World War had stopped the publication of this important work, so that even in making my catalogue I had nothing to rely on except the confused mess in the existing literature. Mr. Arnold nevertheless sent me some valuable comments on several of the species, together with the following remarks on the genus as a whole: "The genus *Crematogaster* is perhaps the most troublesome of all, and for this there are several reasons. First of all, it is a very large genus, so large that authors get lost in the vast number of described forms and of their collections. Secondly, the species of this genus in Africa are exception-

ally liable to minute variations in all directions even over a very small area (one might almost say 'on a very small number of adjacent trees,' since most of the species are arboricolous), and even within the limits of the same nest. This is a point which can only be properly appreciated by the man on the spot, and is persistently overlooked by the cabinet naturalist. Thirdly, in the separation of species and varieties, too much emphasis has been placed on unreliable characters, such as the length and degree of divergence of the epinotal spines, the strength of the median mesonotal tubercle, and the proportions of the petiole. Lastly, a good deal of confusion is due to sheer carelessness and contempt for exact methods." Other almost equally baffling and disconcerting complexes of forms are presented by *Camponotus* (*Myrmoturba*) *maculatus* (Fabricius) and *C.* (*Myrmotrema*) *foraminosus* Forel and their numerous subspecies and varieties. My catalogue of these probably has little value except as a record of present taxonomic confusion.

It seemed advisable to include in the work dichotomic tables for the identification of the known genera and subgenera of ants. In constructing these tables I have also been greatly aided by Dr. Bequaert. In drawing up those of the subfamilies Ponerinæ, Cerapachyinæ, Dorylinæ, and Dolichoderinæ, extensive use was made of Emery's fascicles in Wytsman's 'Genera Insectorum.' We have, of course, added brief diagnoses of all the genera and subgenera since published. As the publication of the fascicles on the Myrmicinæ and Formicinæ was rendered impossible by the German occupation of Belgium, we were compelled to create tables for these two subfamilies from such materials as we could find in the literature and from a study of representative species in my collection. This portion of the tables is, therefore, less satisfactory and may need modification when Emery's account of the Myrmicinæ and Formicinæ appears.

Among the collections made by Messrs. Lang, Chapin, and Bequaert, there was also considerable material representing portions of the singular plants (myrmecophytes) regularly inhabited by some of the Congolese ants. As Dr. Bequaert, during his sojourn in equatorial Africa, had made many detailed notes and drawings on the relations of ants to plants, he was requested to write an article on myrmecophytism. My colleague, Prof. I. W. Bailey, undertook to study the histology of the plants under discussion and reached such striking and important conclusions, both botanical and zoological, that there could be no doubt about the propriety of including his paper as a portion of the report.

After much of the taxonomic work had been completed, Dr. Bequaert discovered that additional ant material could be obtained from the stomachs of the numerous frogs and toads collected on the expedition, and Mr. G. K. Noble kindly went over all the Congo amphibians and cut out and labelled their stomachs. Among the ants, which were in a surprisingly good state of preservation, there were many interesting forms, notably representatives of the genera *Phrynoponera*, *Psalidomyrmex*, and *Leptogenys*, not taken by the collectors in the field. The results of this study suggested the writing of a special compilation by Dr. Bequaert on ants as the food of other animals. In future it will be advisable for collectors of ants in the tropics carefully to examine the stomach contents of all batrachians as well as those of ant-eaters.

The Lang-Chapin-Bequaert collection also contained a few striking myrmecophiles which I have described in a special chapter together with an account of an interesting collection of myrmecophilous beetles made for me by Mr. George Schwab in the Cameroon. In writing this part I have had the assistance of Dr. W. M. Mann, to whom the new species of Staphylinidæ are to be attributed.

I would express to the authorities of The American Museum of Natural History my deep appreciation of their kindness in enabling me to add to the interest of the volume by including in the text the many figures drawn by Mrs. Helen von Ziska, the maps of distribution, and especially the colored frontispiece by Mr. L. A. Fuertes and the reproductions of Mr. Lang's beautiful photographs of Congolese ant-nests. I trust that in its present form the work will not only prove to be valuable as an account of the Formicidæ collected by the first American expedition to the Congo, but will also serve as a book that can be profitably taken into the field by future collectors throughout the Ethiopian Region.

A list including the various localities in which Messrs. Lang, Chapin, and Bequaert collected the material treated in my taxonomic review precedes the Catalogue of Ethiopian ants.

Wm. M. Wheeler

New Species, Subspecies, and Varieties, with their Type Localities

In addition, the following new names are proposed in this paper:

Phyracaces santschii Wm. M. Wheeler, p. 56; for *Phyracaces foreli* Santschi ♀, 1915; not *Phyracaces foreli* Santschi, ♂, 1914.

Platythyrea cribrinodis var. *brevidentata* Wm. M. Wheeler, Part VIII; for *Platythyrea cribrinodis* var. *punctata* Arnold, 1915; not *Platythyrea punctata* (F. Smith), 1858.

Monomorium modestum var. *smutsi* Wm. M. Wheeler, Part VIII; for *Monomorium modestum* var. *boerorum* Santschi, 1915; not *Monomorium minutum* subsp. *boerorum* Forel, 1910.

Monomorium salomonis subsp. *subopacum* var. *santschii* Wm. M. Wheeler, Part VIII; for *Monomorium salomonis* subsp. *subopacum* var. *senegalense* Santschi, 1913; not *Monomorium senegalense* Roger, 1862.

Ecophylla crassinoda Wm. M. Wheeler, p. 227; for *Œcophylla brevinodis* Wheeler, 1914; not *Œcophylla brevinodis* Ern. André.

Polyrhachis militaris subsp. *cupreopubescens* var. *dido* Wm. M. Wheeler, p. 261; for *Polyrhachis militaris* subsp. *cupreopubescens* var. *argentatus* Stitz, 1910; not *Polyrhachis argentatus* (F. Smith), 1858.

Protholcomyrmex Wm. M. Wheeler, p. 162; subgenus of *Monomorium* with *Monomorium rothsteini* Forel as the type.