

**FURTHER RESEARCHES  
ON NORTH AMERICAN  
ACRIDIIDÆ**

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Further Researches on North American Acridiidae by Albert Pitts Morse

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ACRIDIDÆ

FRONTISPIECE



TYPICAL TETTIGIAN HABITAT IN LOWLANDS OF ARKANSAS.  
ASHDOWN, ARKANSAS.

FURTHER RESEARCHES  
ON  
NORTH AMERICAN ACRIDIIDÆ

BY

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## FURTHER RESEARCHES ON NORTH AMERICAN ACRIDIIDÆ

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### INTRODUCTION.

The following report is based upon data obtained during a second field trip of ten weeks' duration in the summer of 1905 under the auspices of the Carnegie Institution of Washington, and forms a partial field study of the Acridian fauna of the central Southern States. A large amount of material and of biological data and several undescribed forms were secured.

### ACKNOWLEDGMENTS.

To the Trustees of the Carnegie Institution of Washington I wish to express my deep appreciation of the liberality which has enabled me to conduct these investigations. I desire also to express my indebtedness to Drs. B. L. Robinson and M. L. Fernald, of the Gray Herbarium, for the determination of plant specimens; to Mr. A. N. Caudell, of the United States National Museum, for aid in identifying material; to Mr. Samuel Henshaw for favors received in connection with the examination of material in the Museum of Comparative Zoology; and to him and Mr. S. H. Scudder for their unfailing interest and encouragement in this work.

### PURPOSE, METHODS, AND OUTLINE OF TRIP.

#### PURPOSE.

The purpose of the second trip, which was undertaken in continuation of the work of the first, was primarily, like that, to secure general information regarding the North American locust fauna and its ecology over a wide extent of relatively little-studied territory. Such information once secured (as is now the case for the greater part of the country), further effort bearing upon details of taxonomy, distribution, ecology, and variation can be more wisely directed.

#### METHODS.

The general information needed can be most effectively secured by a rapid reconnaissance or sampling process, visiting as many points of widely varying physical condition in the territory under examination



as may be reached in the time available. If possible, sufficient time should be spent in each locality to enable an examination to be made of each kind of locust habitat represented in its vicinity. This will give a good general idea of the locust fauna of that locality and may usually be done in from one to three days of field-work, according to the weather, the character of the locality, the number of habitats represented, their accessibility, etc. This method, however, is often impracticable when it is necessary to cover a large extent of country in a limited time.

#### OUTLINE OF TRIP.

At the beginning of the season of 1905 it was planned to continue investigations by making a general reconnaissance similar to that of 1903, during the summer vacation, in the next group of States west of those examined in that year, viz, Tennessee, Alabama, Mississippi, Louisiana, and Arkansas. Accordingly, passage was taken July 5 for Chattanooga, via Washington and Cincinnati, in order to secure at first hand, albeit from a car window, some knowledge of the physical conditions with reference to locust habitats which are found in southern Ohio, eastern Kentucky, and Tennessee, a region not previously examined in person.

Collecting was begun on Sand Mountain plateau in the vicinity of Trenton, Georgia, a point visited late in the season of 1903, in order to secure data, if possible, on those species appearing in the adult stage only early in the season (see fig. 1). Other stops were made at Valley Head, Alabama, to visit Lookout Mountain; Anniston, the readiest point of approach to Cheaha Mountain, the highest summit in Alabama, and Tuscaloosa. During this portion of the trip it was learned that the season was very backward, both vegetation and locusts being late in development, probably owing to the excessive amount of cool and rainy weather of the spring months. In consequence of this fact I hastened southward to Gulfport, Mississippi, on the Gulf coast, stopping at Meridian and Hattiesburg en route. After three days spent there and at near-by points the presence of yellow fever in New Orleans was announced, and in the hope of being able to do the work planned for that vicinity and get away before freedom of travel was interfered with, should that difficulty arise, I went immediately to New Orleans and spent one day in the suburbs and another in a trip down-river and back to the marsh region at Buras, the present terminus of the railroad. Learning that if I remained in the city longer there was every likelihood of enforced and probably prolonged delay, I went west to Franklin, with the intention of collecting there

until a health certificate enabling me to travel freely could be secured. An examination of the country showed that owing to the daily and long-continued torrential rains which characterized the early summer in Louisiana, Arkansas, Texas, and the Territories, effective collecting was impossible in consequence of the semi-inundated condition of the flat country.



FIG. 1.—Sketch map showing route traversed during the season of 1905.

At this juncture I was fortunately able to secure from an authoritative source information of the true magnitude of the fever situation in Louisiana. This was to the effect, as everyone now knows, that the fever had been in the city two months instead of a few days, that nearly 100 cases had occurred to date, and that two other points, and probably more, besides New Orleans, were infected. This statement was accompanied with the advice of one experienced in fever quarantines to "get out of the State as soon as you can, if you can." Under the circumstances, in order to avoid prolonged delay under highly unfavorable working conditions and the waste of valuable time and opportunity, it seemed best to act at once upon this advice, which was done forthwith.

Texas and Mississippi having already declared a quarantine against Louisiana, the next day saw me at work in western Arkansas, in which section and the eastern part of the Indian Territory I collected with good results while awaiting development of the fever situation. Finding that there was no prospect, owing to quarantine restrictions, of

examining advantageously a large portion of the affected States, which I had intended to study, a change of the original plan became necessary. I decided to spend the remainder of the season in a trip through northern Texas as far as the Staked Plains, and return through Oklahoma and the Indian Territory, visiting the Wichita Mountains en route, and northwestern Arkansas, if practicable, at the end of the trip.

This course was decided upon with the double purpose of examining a district whose locust fauna was relatively little known and of studying the biological conditions presented by the transition between the humid Mississippi Valley and the Great Plains, particularly with reference to the distribution of brachypterous locusts, a study of which during several years in New England, on the Pacific Coast in the summer of 1897, and in the southeastern States in 1903 under the auspices of the Carnegie Institution, led to the conclusions in my first report (Publication No. 18, Carnegie Institution of Washington) relative to the significance of brachypterism.

Going south to Denison, Texas, this plan was put in effect. Stops were made at Bonita, in the western or Upper Cross Timbers, Wichita Falls, Clarendon, and as far west as Amarillo, on the Llano Estacado, in the center of the Panhandle. At this point I turned back, retracing my course to Quanah, thence northward through southern Oklahoma, paying a brief visit to Mount Sheridan, one of the two highest peaks of the Wichita Mountains. From thence, after a stop at Shawnee and another at Wilburton to examine an interesting bit of prairie meadow noted on the outgoing course, I returned to western Arkansas and visited Magazine Mountain (whose summit is the highest point of land between the Appalachian and the Rocky Mountains), the Arkansas Valley, and the Ozark uplift at Winslow and Fayetteville.

The trip was carried out successfully as outlined, collecting being brought to a close at Fayetteville, Arkansas, with the advent of rainy weather in early September. On the return trip to Wellesley, a day's stay at Indianapolis with Prof. W. S. Blatchley, State geologist, who has made a special study of the Orthoptera of that State, and another spent in a visit to the collection of Orthoptera at the National Museum, in charge of Mr. A. N. Caudell, proved most profitable.

Over 9,000 Orthoptera, of which the great bulk are Acridiidae, representing about 120 species, including several undescribed forms, were secured, together with a mass of data relating to distribution and biology.