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& Chamberlain

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The Occurrence of Insects at Some Height in the Air, Especially on the Roofs of High Buildings

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INTRODUCTION

The occurrence of insects at considerable elevations has been known for years, and in most cases these records were assumed to be unusual, or else were attributed to upward currents on the slopes of elevations, such as mountains. It is doubtful if many entomologists thought that insects habitually occurred at considerable heights in the free air. The capture of three small flies, a *Mesogramma,* a *Hylemyia* and a *Chrysotus* on an airplane trap in August 1926, the first two at elevations of 3000 feet and the last at an elevation of 1000 feet, suggested that small insects at least might be found in the higher air more frequently than had been supposed. This was confirmed by much larger catches, and these at higher altitudes and still unpublished, by agents of the Federal Bureau of Entomology operating in Louisiana.

Our airplane data mentioned above was an incentive to further work, and during the season of 1927, several traps were attached to various types of kites for the purpose of demonstrating possibilities of capturing insects by such methods. Some progress was made, but this investigation has not been carried far enough to justify a detailed account.

It was decided to try in a preliminary way collecting on the roof of the State Education Building at Albany. The results were so satisfactory that the work was continued throughout the season, and in addition, collections were made on the roofs of two other buildings in the State, and also in the observation rooms of two fire towers as detailed below. The following records and data are restricted to the insects obtained on these various structures.

DESCRIPTION OF COLLECTING SITES

State Education Building. The State Education Building at Albany is located on the brow of an elevation, some 150 feet above the Hudson river, and viewed from a distance, particularly the east, occupies a commanding position, although it is slightly overtopped by the towers of the near-by State Capitol and is very much lower than the newer State Office Building. The roof of the Education Building covers approximately two and one-half acres, and is from 128 to 148 feet above the street level. It is considerably higher than the tops of adjacent trees (fig. 1). There is a broad gutter, running around the building, some seven feet eight inches wide along the ends and front (figs. 2 and 3), this latter with an unbroken length of 590 feet. The gutter on the rear is five feet wide (fig. 4), and the longer portion, that west of the north wing, is 309 feet long. The

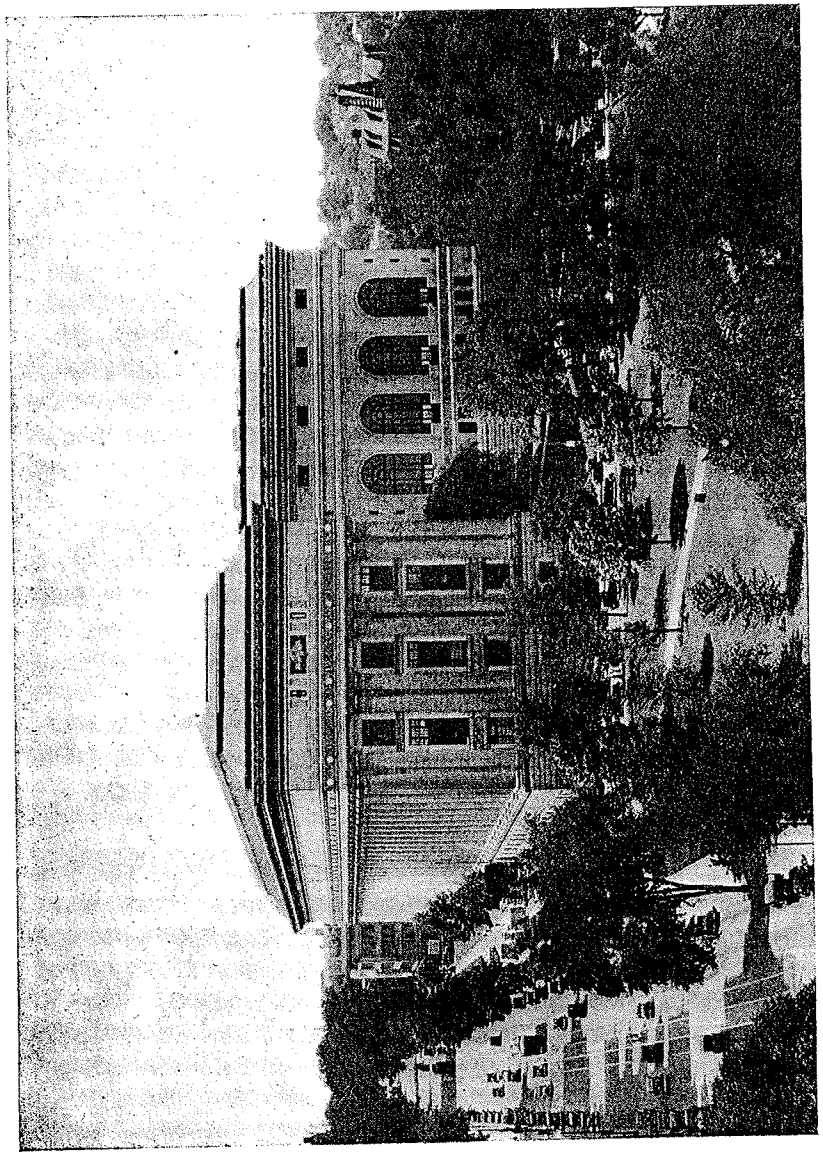

Figure 1 Eastern view of the State Education Building. Note that it towers well above adjacent trees.

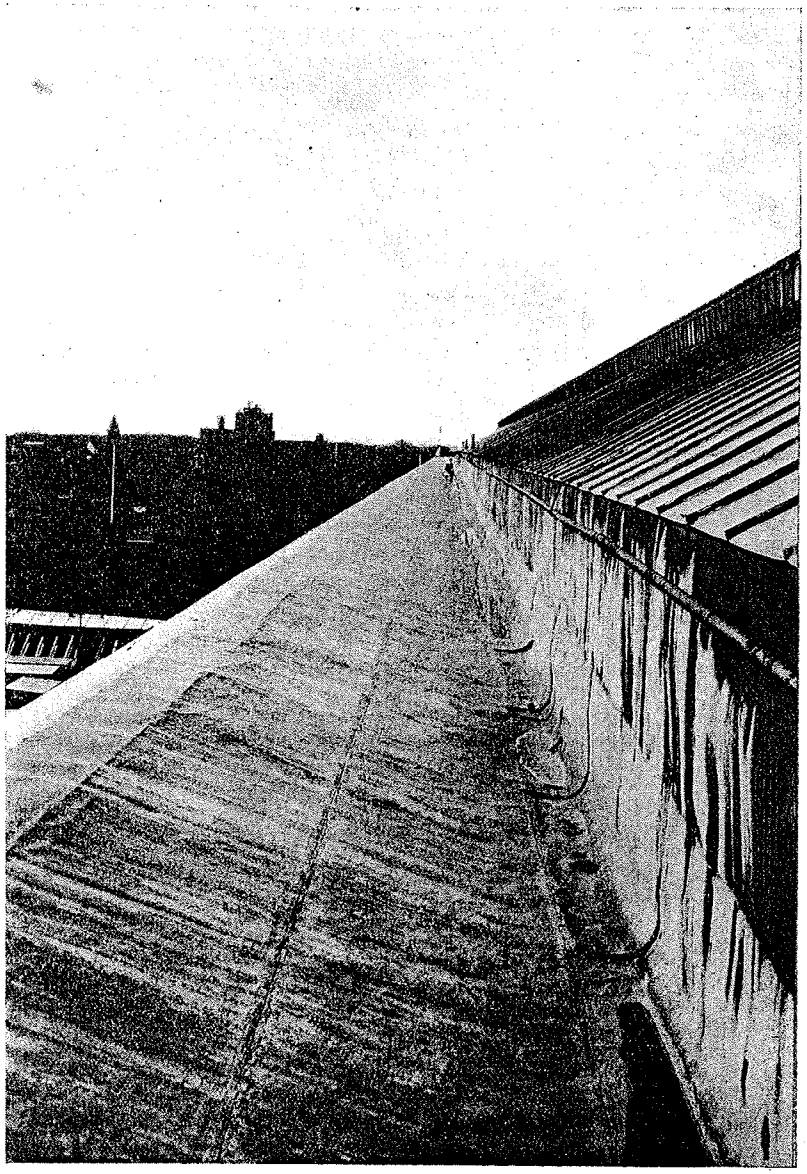

Figure 2 Wide roof gutter along the front of the State Education Building, 590 feet long and nearly 8 feet wide. Note the pools of water.

depth of the gutter is approximately 10 inches, and here and there along its length are a number of nearly permanent pools of water (figs. 2 and 3). Directly above the gutter there is a vertical metal covered wall, four feet high, this latter being 125 feet above the sidewalk. The distance around the building is approximately one-third of a mile.

The simplest way of understanding the situation is to regard the roof and gutter as a smooth area affording no shelter to insects dropping thereupon, and the collections therefore indicate, in a measure at least, the "insect fall," that is, the number of insects dropping from the air upon the area. At certain times of the day, especially in the warmer months, the heat speedily killed the insects resting upon the hot metal. It was also noted that beetles or flies rolled along the surface by the winds were slow to move, and not a few lodged upon the smooth tin upside down, and were unable to right themselves and escape. The vertical wall just above the gutter was so smooth that many insects attempting to light thereupon, dropped to the bottom and were then speedily overcome or trapped by the heat, wind or

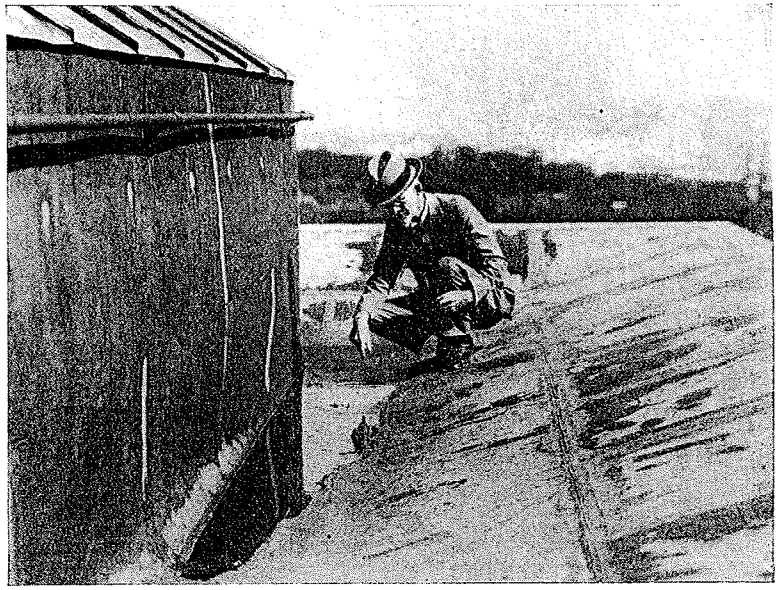

Figure 3 Corner in wide gutter, showing a pool of water

water in the pools. It was found by experience that the gutters were much more favorable collecting places than the much larger higher roof area. This is probably due in part at least to the curling wind currents dropping the insects either in the gutter or on the vertical

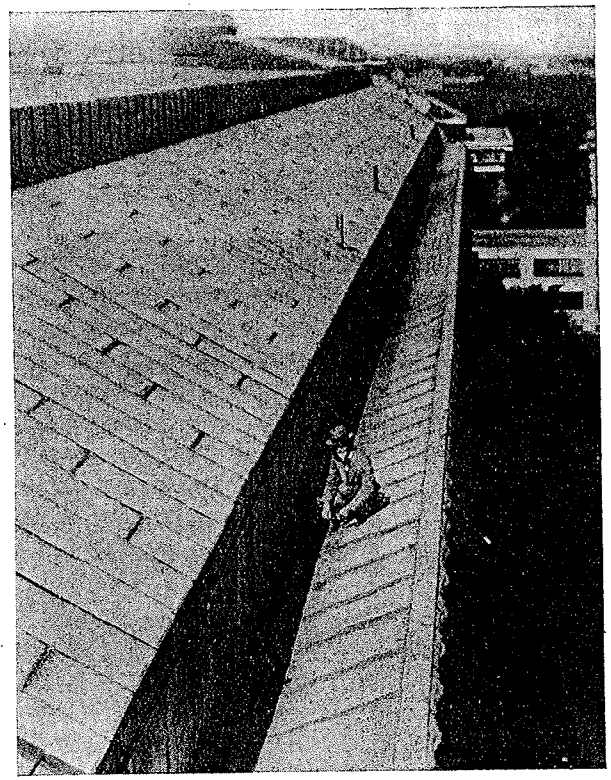

Figure 4 Narrow roof gutter along the rear of the State Education Building, 309 feet long and 5 feet wide

wall above. It was also found by experience that a net was of little value, since most of the insects were readily picked up. A small flock of pigeons frequented the gutter and doubtless devoured many of the larger and more conspicuous species, especially the moths.

Graybar Building. Two collections were made on the 30-story Graybar Building, Forty-fourth street and Lexington avenue, and close to the Grand Central Station, New York City.

Westchester County Lighting Company Building. There was one opportunity of collecting on the roof of the 11-story building of the Westchester County Lighting Company at First street and First avenue, Mount Vernon. This is close to the business center.

Fire Tower, Crane mountain. The collections on Crane mountain, Athol, Warren county, were made by William Wood, fire observer. The elevation of the site is 3254 feet, and the tower has a height of 35 feet.

Fire Tower, Hill 7, Stephentown. Collections on Hill 7, Stephentown, Rensselaer county, were made by Fire Observer Horace Adams. The elevation of the site is 1960 feet and the tower has a height of 60 feet. The cooperation of Mr Wood and Mr Adams was secured through the kind offices of William G. Howard, director of lands and forests, State Conservation Department.

GENERAL OBSERVATIONS

As far as the roof of the State Education Building is concerned, sunny days with conditions favorable to mild convectional currents appeared to aid in trapping many of the local, particularly small species, while clear days with mild convectional currents and a fair breeze generally resulted in the capture of a maximum number of specimens. Most of the insects were taken in the somewhat sheltered portions of the gutter or in water pools, and there is reason for believing that during windy days, a large proportion of the gutter was swept clear by the breezes.

A few large insects, such as the harvest fly, *Tibicen canicularis* Harris, the poplar borer, *Saperda calcarata* Say, the large water beetle, *Dytiscus harrisi* Kby., the pigeon tremex, *Tremex columba* Linn., and a few of the larger dragon flies were taken on the roof. Most of the specimens were medium or small insects, and some of the smallest, such as leaf hoppers and clover weevils were found in large numbers.

SUMMARY AND DISCUSSION OF RESULTS

The results may be summarized briefly as follows. Approximately 1000 different species of insects representing a wide variety of groups were captured. Among these were found some 25 species new to the New York State Collections or to the recently published state list, one species not previously recognized in North America, and two new genera.

The semidomesticated honey-bee, *Apis mellifera* Linn., was taken in large numbers from early in the spring to late in the fall. There was a considerable series of ants, probably mostly local. Six species of gall wasps were captured, although the nearest oaks were approximately one mile away. There was an abundant representation of the recently introduced and widely distributed birch sawfly, *Fenusa pumila* Klug.

The beetles were represented by a large series, some 40 families and well toward 400 species. There were 59 species of *Carabidae* or ground beetles, 48 species of *Chrysomelidae* or leaf beetles, 33 species

Milichiidae

Milichiella lacteipennis Lw. Det. Johnson.
July 8(3), August 12(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.

Desmometopa latipes Meig. Det. Johnson.
August 22(1) Taken on top of fire tower, Crane mountain, Athol, in the Adirondacks.

Mallochiella glabra Fall. Det. Johnson.
May 2(1)
July 10(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.

Mallochiella halteralis Coq. Det. Johnson.
August 21(1), 22(1) Taken on top of fire tower, Crane mountain, Athol, in the Adirondacks.

Anthomyiidae, Anthomyiids

Phaonia bysia Walk. ? Det. Johnson.
July 2(1)

Phaonia cayugae Johan. ? Det. Johnson.
July 31(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.
Not recorded in New York State List.

Helina pectinata Johan. Det. Johnson.
July 10(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.

Hydrotaea houghi Mall. Det. Johnson.
May 7(1)

Ophyra leucostoma Wied. Det. Johnson.
July 21(1)

Fannia canicularis L. Det. Johnson.
July 16(1)
October 14(1), 27(1), 28(1)

Fannia spp. Det. Johnson.
June 20(1)
July 9(1)

Spilogona sp. Det. Johnson.
June 22(1), 23(1)
September 30(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.

Lispocephala alma var. *pallipennis* Zett. Det. Johnson.
October 22(1) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.
Variety not recorded in New York State List.

Coenosia pallipes Stein. Det. Johnson.
October 27(1) Not recorded in New York State List.

Xenocoenosia calopyga Lw. Det. Johnson.
October 26(1)

Anthomyia pluvialis L. Det. Johnson.
July 8(1)
August 19(2) Taken on top of fire tower, Hill 7, Stephentown, Rensselaer county, N. Y.
September 5(1) Taken on top of fire tower, Crane mountain, Athol, in the Adirondacks.