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A NEW LEAF CUTTING ANT.

BY G. K. MORRIS.

ISLAND Heights is the name given to a camp meeting ground and summer resort on the New Jersey coast, near the ancient village of Toms River, and situated on Barnegat bay. For many years the greater portion of the island was neglected by man. It is but two years since the woodman's axe sounded the signal of approaching change. It is now a pleasant summer town.

This summer, early in July, I took up my abode there for the term of my vacation. My first observation was, that the place was an Eden for ants. In an unimproved block two hundred feet square, there are nearly forty species, representing several genera.

Of course most of them are well known; but nineteen of them were strangers to me and such authorities as I was able to consult. These have been sent to Dr. Forel for determination.

One of the number, the most curious and interesting of all, is a leaf cutter, said to be new to science both by Dr. McCook and Mrs. Treat. The worker is a fraction over an eighth of an inch in length. The male and female are nearly of a size, and but little larger than the workers. In color, as seen in mass in alcohol, they are light brown. The head is dark, and a dark band runs down to the point of the abdomen, which on the under side is lighter. The head is rugose, and the entire surface of the body is rough and hard. On the thorax and the metathorax there are short spines. The node is like a rough irregular bead with the thick end next to the abdomen. The mandibles are toothed and seem striated on the outer surface.

When first observed these ants were marching in line, each one laden with a piece of the fine needle-like leaf of pine seedlings. They did not carry their loads as other ants do, but on their heads, resting between two ridges that extend from the base of the antennæ to the top of the head. Some of them carried pieces longer than themselves, in which cases the needle lay along the back, one end being held in the mandibles. Tracing them to the seedling, which was nearly a rod from their formicary, measured by their path, I found them engaged in cutting. It took but a moment for one of them to sever a leaf. Some pieces lay on the ground as if the cutter had been delegated to that work, but as I watched, each cutter carried down the piece he had cut and bore it to the nest.

In the line marching towards the nest, was one carrying a small white stone, and others carrying the striated droppings found under bushes on which worms are feeding. The only other leaf carried by them, so far as I have observed, is the leaf of cow wheat (*Melampyrum americanum*), a plant which abounds in the woods. Of this plant they collect the flower as well as the leaf.

On the 17th of August I dug out a formicary of the leaf cutter in the presence of Mrs. Treat, who, having heard of my observations, came on to see for herself. Our discoveries were startling. Instead of small cells we found what, in comparison to the size of the ants, may be called caverns. Unfortunately these were crushed by the spade, so that their size and shape could not be accurately determined.

In the cells were masses of spongy material of a leather color, and full of irregularly formed cells or pockets in which were some callow ants and many mature ones. Two of these large cavities were found containing this strange material. It was evident that the ants manufactured the leaf cuttings into a soft nest for their young. There were a few males and females, and one ant without wings much larger than any others in the formicary.

The spongy material broke down with handling, but showed its vegetable origin under the glass. Indeed, a few of the particles found in the first cell, near the surface of the ground, had not entirely lost their green color. Our impression was, that the leaf matter was partially masticated and then webbed together.

On September 8th I selected for examination a nest in a more retired locality, and from which the trees had just been removed. Immediately under the turf, not more than three inches below the surface, was the first cell. It was about the size of a large coffee cup and not far from the shape of one. The sides were smooth, compact and firm, though made in the clean white sand. They were lined with fine yellow sand which had been brought up from a depth of about two and a-half feet. This seemed as if held loosely together by a web-like substance and constituted a thick soft curtain against the walls. On the floor lay a mass of the porous, spongy substance found in the first nest. A few ants were found here differing in size and color; one was nearly red, another brown with dark band, and others grayish. The latter were callow.

Adjoining this was a small cell one and a-half inches in diame-

ter, containing very little of the substance described above. In the loose material on the floor of this cell were found living forms of minute size, and unknown to me.

Five inches distant was a still smaller cell, in which closely stowed away, were ants, apparently prisoners. The approach to their dungeon had been plugged for the whole distance with the yellow sand, so that it could be traced like a yellow streak in white candy.

Three inches below the level of the cells last described was another three and a-half inches deep, two and a-half wide by three and a-half long. In form it resembled a coffee cup flattened slightly. I was fortunate enough to approach this one so carefully as not to disturb its interior arrangement. Having made a pit by the side of it, I carefully cut away the loose sand with a large knife until one side was removed, and the wonderful architecture within was before my eyes. I ceased work in utter astonishment. My excitement was intense, and my delight indescribable.

The floor was covered with small smooth pebbles. The bulged side of the cup was protected by a curtain of yellow sand fully a-half inch thick in the middle and tapering to nothing at top and bottom. The white sand in which all this wonderful work had been done, was packed and smoothed and almost glazed until it had become so firm that no jarring would shake a particle from its place.

But what most filled me with wonder was the resemblance of the interior to a bee hive. Suspended from a tough root at the top of the cell, and nearly filling the entire space, was what resembled a honey-comb in all save regularity of form. There were several masses of it hanging side by side as in a hive. In place of regular cells, however, were irregular pockets, in which the young are reared.

I cannot tell the reluctance with which I removed this comb, nor my regret at the impossibility of preserving it just as it hung. However, it is preserved, though not in form as found, and is before me as I write. It has been seen by Dr. McCook, who has made a study of the leaf cutting ant of Texas. In his opinion the ant I have described is an *Atta*. He came to the heights and investigated a formicary, but was unfortunate in that the day was stormy. He succeeded, however, in verifying my observations.