

Descriptions of three new species of Gorgoniæ, in the collection of the Academy.

BY GEO. H. HORN.

LOPHOGORGIA.

*L. clavata*.—Polypary bipinnate. Trunk and branches very much flattened. Branchlets thick, and but slightly compressed, clavate at their extremities. Calices numerous and projecting. Coenenchyme thick. Color reddish-pink.

This species differs from the *L. flammæa*, in its more numerous and projecting calices. The branchlets of the latter are much flattened and acuminate, and have an intense red color.

Locality unknown.

*L. aurantiaca*.—Polypary very much subdivided. Trunk but slightly flattened. Branchlets numerous and rounded, arising in pairs from opposite sides of the branches. Calices numerous and slightly elevated. Coenenchyme thin. Color orange, striped with red.

This species is much more subdivided than either of the others, and has its trunk and branches much less flattened. The color of the trunk, deprived of the cortex, is red.

Locality unknown.

RHIPIDIGORGIA.

*R. Engelmanni*.—Flabellate, coarsely reticulate. Branches much flattened, from one to two and a half lines wide. Interspaces rounded, occasionally elongated to the extent of one inch. Color ochreous externally, purple or reddish within.

The fronds of this species are higher than wide, (height 9 inches, width 6 inches,) bearing no free branchlets. Calices large and crowded, quadrangular in outline, with no elevation of their edges. Coenenchyme thick, easily crushed.

Locality. Mazatlan. Dr. Engelmann.

ANTBIB #2336

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The Cutting Ant of Texas.

BY S. B. BUCKLEY.

MYRMICA (ATTA) TEXANA—"Cutting Ant."

Description.

*Neuter*. Color reddish-brown; head disproportionately large, mandibles large, triangular falcate, serrate, bent downwards in adult, two small, short spines at the back of each lobe of the head; sinus between lobes large; antennæ two, two-jointed, last joint clavate; thorax small, compressed, upper surface armed with six spines, front pair inclining forwards, middle pair erect, smallest, and near front pair, back pair inclining backwards; connecticum nodose, two-jointed; abdomen about half as large as head, oblong, ovate, obtuse; legs two-clawed, a claw or spine near the base of the tibia of the two front legs. Adult  $4\frac{1}{2}$  lines long.

*Female*. Color reddish-brown; head disproportionately small; sinus small between its lobes, rudiments of spines at back of each lobe; antennæ and mandibles as in neuter; thorax large, upper front protruding over the head, compressed, upper surface covered with thick downy hairs; abdomen larger than thorax.

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ovate, obtuse. Length without wings,  $8\frac{1}{2}$  lines. Largest wings 1 inch 1 line in length. Entire length, 1 inch 4 lines.

*Male.* Resembles female, but is a little smaller, with its head and abdomen more acute.

These ants have homes in the ground. A few of their underground dwellings have lately been brought to view, by digging, in order to kill the ants, because they destroy what belongs to the farmer and horticulturist. The extent of these ant galleries and cells, is so great as almost to exceed belief; but several of the excavations made to slay ants are within the incorporated limits of the city of Austin, and have been seen by hundreds of its citizens. The underground rooms of these cutting ants are rounded or oblong cavities, all connected by cylindrical passages, of a diameter varying from one to three or even more inches. Some cells are six inches wide, by nearly as many in height, and others twelve inches high, with a shorter diameter of some six to eighteen inches and the longer diameter three feet, and sometimes even more. These chambers are often one above the other, and again side by side; but on the whole, they do not seem to be placed with any apparent order, being scattered underground at various distances apart, from two inches to as many feet. In a clay soil they appear to be coated or varnished with a very thin, dirty brown, waxlike secretion. In sandy ground, to keep the walls firm, they are plastered with a black limestone earth, abounding in portions of the prairies and river bottoms. This often has to be carried a distance of many rods; and then the amount of their labor and its results are truly wonderful, showing their knowledge to be equal to that of any race of ants known. Their lowest chambers are generally ten and twelve feet deep, while the upper cells are rarely nearer the surface than eighteen inches. I extended a tape line down to the bottom of one, and found it seventeen feet deep; at one of their largest dens, a room was found sixteen feet beneath the surface, and several others were at near the same depth. At that place, the ground is dug out from twelve to sixteen feet deep, extending over an area having an average diameter of twenty-five feet, all of which was filled with ant cells. Several large avenues (4--5 in. diam.) entered the bottom of this large den. On striking an avenue, some ants were seen to enter it followed by others, loaded with barley, all coming from that underground passage. Where they got the barley was the question, which was finally solved by going to a stable more than three hundred feet distant; from which ants were seen to descend, each with his barley grain, and enter a hole in the ground near the base of the stable, which was the only place in the vicinity where there was any barley. Another avenue on the other side, is said to come out at the bank of a stream, between two and three hundred feet distant, where are some elm trees, from which the ants obtained bits of leaves, and carried them through said avenue into the base of the den. That they have extensive underground passages, there is not the least doubt. A gentleman recently told me of an instance where they dug under or tunneled a stream to get into a garden. There was a large ant den across the stream, and for a long time the garden was safe from their depredations, but finally the cutting ants were seen there, carrying bits of leaves into a small hole in the ground. There was no ant den in the vicinity, except the one across the creek, and as there were no dirt heaps on the surface of the ground in the garden, as there always are above an ant den, the inference was, that those cutting ants seen in the garden belonged to the tribe across the river; if so, it is probable that some of their wise ones, when on the trees in the vicinity of their abode, beheld the fine things in the garden, to obtain which they advised tunneling the stream.

The question will naturally arise, how is it possible for them to direct their course in digging those long underground passages so as to reach the surface at the wished for spot? Let those who ask, also answer; I only know that such long avenues exist, having thrust a long stick into one at the bottom of one of their dens, and I have also seen the outer openings of many of them on

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the banks of rivers and streams, whose water gives the ants drink, and where food can easily be had from the trees and bushes usually found growing on the banks of streams in all prairie lands.

At the large ant den in Austin, before spoken of, millions of working ants, and bushels of eggs and larvæ, with great numbers of males and females, were destroyed. As soon as a large apartment containing the eggs, larvæ and winged ants was found, a fire was kindled forthwith among them, for which purpose, light, combustible stuff was kept near. The eggs were of different sizes, belonging to opposite sexes, also showing, probably, that they grow, and were in a greater or less advanced stage of development. The workers at first are very small, scarcely a line in length. The eggs mixed with minute young ants, were in a soft, grey spongy substance, apparently leaves, finely triturated and mixed with an animal secretion.

It is said they sometimes abandon their caves, when from long residence the chambers become filthy, or perhaps they are injured by heavy rains, or it may be that the ants desire a better situation for provender. Whatever may be the cause, they have been known to emigrate en masse, and after making new excavations, and dwelling in them a few years, to return again to their old first residence. It is probable that they have a division of labor, some nurse the young, and others provide food. In one instance I saw one cut off a segment of an elm leaf, and another seized it as soon as cut, and carried it away, but generally I have noticed that he who cuts also carries. When cutting, one mandible is inserted, and carried slowly along; the head swaying to and fro, and the other mandible moving its sharp point, apparently breaking the surface to lessen the thickness to be cut by the other. The ant often stands on the part of the leaf which he is cutting off, but he is careful to remove to a firm place before it is finally severed, which done, he seizes one edge of it with his mandibles, and with a rapid movement throws it on his head and thorax, so that its lower edge rests between the lobes of the head and the spines of the thorax, and the upper edge is aloft. Away he goes, and joins the busy throng in the main path, which looks as if the ants had a gala day, and were marching with banners flying. Lately, on the banks of the Colorado river, near Austin, I saw multitudes of ants in their path, going up hill with fragments of leaves, and hack berries, (celtis,) some entire, and others with a small portion cut off, to render them lighter and suitable to be carried by the smaller ants. The place at which they entered the ground was about six feet from the top of the bank. This pathway was steep, and even perpendicular, for a distance of five or six inches, at a place about one foot below their doorway. The labor was severe to carry the berries up this path, but the struggle was great to get them to the top of the perpendicular spot. In performing this feat the berry carriers met with many falls, often rolling one and two feet down the hill but always sticking fast to their burdens, and trying again until they finally triumphed. One fell when near the top, and as he came up again, and was about to succeed, I touched his load with the point of a knife, and down it and ant went. His third attempt was put to the same test, but even then, he did not get angry, or show the least impatience, but cheerfully took his berry, and went up and in at the door of the long avenue.

A lady lately showed me a safe where she kept sugar and sweetmeats, which drew swarms of small ants. The legs of the safe were then placed in vessels of water, and the ants did not succeed in reaching the sweets during several days, but finally many of them were found in the sugar. After some little study to discover how they got there, they were seen to drop on the safe from the roof at the distance of about two feet above. These, however, were not the cutting ants, and I only mention their feats because they are similar to those related of ants by an East India officer. A gentleman told me that he suspended sugar by a string from a rafter in his house, to keep it from ants, but they went up and came down the string. They also were not the cutting ants, which rarely, if ever, enter houses.

1860.]

The cutting ants often assist each other. I saw one which fell with a hack berry, at the vertical place before named. The berry got loose from him, and instead of shouldering it again, he tried to drag it along, but was unable to pull it up the perpendicular. Many passed him and gave the cold shoulder; finally a kind ant came and pushed. By shoving and pulling the two succeeded in getting the berry to the top, when the assister immediately left, and started down the hill. They live on both animal and vegetable food. I have seen them carrying both worms and bugs. Whole beetles and numerous elytra have been found in their cells, but nothing indicating that they lay up large stores of food, like some of the East India ants, which have been seen to fetch their stores of corn to the surface to dry after heavy rains. The common tumble bug, (*Canthon lœvis*), in rolling his ball, sometimes heedlessly backs up over a nest of the cutting ants, and falls a victim, being overcome by numbers. Once I saw a very large one roll his ball into their midst, when he was fiercely attacked by the multitude. At first he stuck his nose in the sand, or rather between his forelegs, but the bites behind were so severe that he roused and flew in circles, finally alighting near me, which was no sooner done than an ant who had accompanied the fight, jumped to the ground, for a moment looked bewildered, then ran for home, it may be, to tell of his wonderful ride on the big bug.

The damage which these ants do, is great, by destroying trees and vegetables. I know of one family who are about to leave a beautiful situation near a fine spring, because the cutting ants have nearly killed their fruit trees and ornamental shrubbery, especially roses, for which they have a peculiar fondness. They have been known to strip a fruit tree of its leaves in a single night. In some sections these ants prevent the cultivation of fruit. Thousands of dollars have been uselessly spent in attempts to kill them by blowing noxious gasses into their dens, or by placing poisons at the doorways of their dwellings. A knowledge of the habits and abodes of these insects show the futility of such attempts; the fact is, but few of these can be reached by gas, let the bellows blow ever so hard, nor can many be killed by poison, even if the most deadly be placed within their doorways, for as soon as they discover harm, they form a new entrance. The only effectual method of destroying them is to dig, and kill the females and young, when the neuters will soon perish. This is so expensive that it will only be resorted to near a garden or dwelling, and as the cutting ants are scattered through western and central Texas, they probably never will be exterminated by man.

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Contributions to the Carboniferous Flora of the United States.

BY HORATIO C. WOOD, JR.

CALAMITES Suckow.

*C. bicostatus* nobis.—Stem slender, bicostate, with distant articulations; ribs undulate, double, a very narrow, alternating with a broader one; tubercles obsolete. The distant articulations and the double, undulate ribs characterize this as a very distinct species.

ANNULARIA Sternb.

*A. dubia* nobis.

Syn. *Bechera dubia* Stern. Vers. vol. i. p. 30, t. 51 fig. 3, 1821. *Annularia minuta* Brongt. Prod. p. 155.

*A. stellata* nobis.

Syn. *Casuarinites stellatus* Schloth. Flora der Vorwelt, t. i. fig. 4, 1804, ejusdem, Nacht. Petref. 1822. *Bornia stellata* Sternb. Vers. i. p. 28. *Annularia longifolia* Brongt. Prod. 1828. *Asterophyllites equisetiformis* Lind. et Hutton, Foss. Flora, vol. ii. t. 124.

[June,