

Notice on the Habits of the "Agricultural Ant" of Texas ["Stinging Ant" or "Mound-making Ant," *Myrmica (Atta) malefaciens*, Buckley]. By GIDEON LINCECUM, Esq., M.D. Communicated by CHARLES DARWIN, Esq., F.R.S., F.L.S.

[Read April 18, 1861.]

THE following is merely an abstract of Dr. Lincecum's communication, containing only what appears to be most remarkable and novel in it in the way of observation.

"The species which I have named 'Agricultural,' is a large brownish Ant. It dwells in what may be termed paved cities, and, like a thrifty, diligent, provident farmer, makes suitable and timely arrangements for the changing seasons. It is, in short, endowed with skill, ingenuity, and untiring patience sufficient to enable it successfully to contend with the varying exigencies which it may have to encounter in the life-conflict.

"When it has selected a situation for its habitation, if on ordinary dry ground, it bores a hole, around which it raises the surface three and sometimes six inches, forming a low circular mound having a very gentle inclination from the centre to the outer border, which on an average is three or four feet from the entrance. But if the location is chosen on low, flat, wet land liable to inundation, though the ground may be perfectly dry at the time the ant sets to work, it nevertheless elevates the mound, in the form of a pretty sharp cone, to the height of fifteen to twenty inches or more, and makes the entrance near the summit. Around the mound in either case the ant clears the ground of all obstructions, levels and smooths the surface to the distance of three or four feet from the gate of the city, giving the space the appearance of a handsome pavement, as it really is. Within this paved area not a blade of any green thing is allowed to grow, except a single species of grain-bearing grass. Having planted this crop in a circle around, and two or three feet from, the centre of the mound, the insect tends and cultivates it with constant care, cutting away all other grasses and weeds that may spring up amongst it and all around outside of the farm-circle to the extent of one or two feet more. The cultivated grass grows luxuriantly, and produces a heavy crop of small, white, flinty seeds, which under the microscope very closely resemble ordinary rice. When ripe, it is carefully harvested, and carried by the workers, chaff and all, into the granary cells, where it is divested of the chaff and packed away.

The chaff is taken out and thrown beyond the limits of the paved area.

"During protracted wet weather, it sometimes happens that the provision stores become damp, and are liable to sprout and spoil. In this case, on the first fine day the ants bring out the damp and damaged grain, and expose it to the sun till it is dry, when they carry it back and pack away all the sound seeds, leaving those that had sprouted to waste.

"In a peach-orchard not far from my house is a considerable elevation, on which is an extensive bed of rock. In the sand-beds overlying portions of this rock are fine cities of the Agricultural Ants, evidently very ancient. My observations on their manners and customs have been limited to the last twelve years, during which time the enclosure surrounding the orchard has prevented the approach of cattle to the ant-farms. The cities which are outside of the enclosure as well as those protected in it are, at the proper season, invariably planted with the ant-rice. The crop may accordingly always be seen springing up within the circle about the 1st of November every year. Of late years however, since the number of farms and cattle has greatly increased, and the latter are eating off the grass much closer than formerly, thus preventing the ripening of the seeds, I notice that the 'Agricultural Ant' is placing its cities along the turn-rows in the fields, walks in gardens, inside about the gates, &c., where they can cultivate their farms without molestation from the cattle.

"There can be no doubt of the fact, that the particular species of grain-bearing grass mentioned above is intentionally planted. In farmer-like manner the ground upon which it stands is carefully divested of all other grasses and weeds during the time it is growing. When it is ripe the grain is taken care of, the dry stubble cut away and carried off, the paved area being left unencumbered until the ensuing autumn, when the same 'ant-rice' reappears within the same circle, and receives the same agricultural attention as was bestowed upon the previous crop,—and so on year after year, as I *know* to be the case, in all situations where the ants' settlements are protected from graminivorous animals."

In a second letter, Dr. Lincecum in reply to an inquiry from Mr. Darwin, whether he supposed that the ants plant seeds for the ensuing crop, says, "I have not the slightest doubt of it. And my conclusions have not been arrived at from hasty or careless observation, nor from seeing the ants do something that looked a little like it, and then guessing at the results. I have at

all seasons watched the same ant-cities during the last twelve years, and I know that what I stated in my former letter is true. I visited the same cities yesterday, and found the crop of ant-rice growing finely, and exhibiting also the signs of high cultivation, and not a blade of any other kind of grass or weed was to be seen within twelve inches of the circular row of ant-rice."

In his second letter Dr. Lincecum proceeds to give some account of what he terms the "Horticultural Ant," which appears to be identical with the "Cutting Ant," *Ecodoma mexicana*, Sm., described by Mr. S. B. Buckley in the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' 1860, p. 233 \*; but as his account does not contain any important additional observations, it is here omitted.

Mr. Buckley also describes (*l. c.* p. 445), the "Agricultural" or "Mount-making Ant," although his account of its habits will be found to differ in several respects from that given by Dr. Lincecum.

Descriptions of some New Species of Ants from the Holy Land, with a Synonymic List of others previously described. By FREDERICK SMITH, Esq., Assistant in the Zoological Department, British Museum. Communicated by DANL. HANBURY, Esq., F.L.S.

[Read April 4, 1861.]

THE ants which form the subject of the present paper were collected in Syria and Palestine by Dr. J. D. Hooker and Mr. Daniel Hanbury, during a visit of a few weeks to those countries in September and October last. The species, though only ten in number, are part of a fauna replete with interest: all the productions, in fact, of the Holy Land are so worthy of our attention, that he who adds even the smallest number of species to the list does not work in vain.

I am not prepared to say how many, or even if any, of the species of Ants forming the present list have been recorded as indigenous to Palestine; but in one or two cases the knowledge of the geographical distribution of ants is rendered highly interesting. Not only do we here find species common to Southern Europe, but in *Formica brunnea* and *Tapinoma erraticum* we recognize insects found even in the vicinity of our own metropolis. A few observa-

\* A notice of this paper will be found in the *Annals & Mag. Nat. Hist.* 3 ser. vi. p. 386.