

THURSDAY, SEPTEMBER 25, 1879

## THE AGRICULTURAL ANTS OF TEXAS

*The Natural History of the Agricultural Ant of Texas: a Monograph of the Habits, Architecture, and Structure of "Pogonomyrmex barbatus."* By Henry Christopher McCook. Author's Edition. Academy of Natural Sciences of Philadelphia. 1879. (London: Trübner and Co.)

THE agricultural ant of Texas was first introduced to the English public in 1862, by means of a communication from Dr. Gideon Lincecum to Mr. Darwin, published in the *Journal* of the Linnean Society of London, and much interest was excited by the account given of an insect which actually sowed seed, tended the crop, and reaped the harvest. No further information being forthcoming, doubts were expressed both here and in America as to the accuracy of the observations, and Mr. McCook went to Texas in the summer of 1877 for the express purpose of testing them. Unfortunately, however, he could only stay about three weeks, which he devoted entirely to observation of the ants. He however obtained information from residents, and carried away some living ants on which to make further observations at home, and the result is given in much detail in a handsome volume of over 200 pages, illustrated by a series of twenty-four plates, giving details of the nests, the attitudes, the habits, the external structure and internal anatomy of the species in question, and some of its allies.

With all this elaboration, however, the main point still remains in doubt, and Mr. McCook does not and cannot tell us whether the agricultural ants really do sow the seed, though they undoubtedly reap the harvest. What he does tell us, however, is sufficiently curious. The insect is a true harvesting-ant, like those so well described by Mr. Moggridge, but it differs from all other species in forming large cleared disks on the site of its nests. These disks vary from two to twelve or fourteen feet in diameter, and are approximately circular, and however thick may be the grassy or weedy vegetation around them the disks are perfectly bare and smooth and thus form very conspicuous objects in the landscape. The openings to the nests and granaries are near the centre of the disk, and in some cases are formed in a central convex or conical mound, while in others the surface is entirely flat. In about one-third of the nests examined by Mr. McCook, the outer border of the disk, sometimes for two feet wide, was covered by a crop of ant-rice (*Aristida oligantha*) differing wholly in appearance and colour from the surrounding vegetation, just as a crop of wheat or oats differs from a field of mixed herbage, while not a solitary weed of any kind was to be found in the belt of ant-rice.

Lincecum had stated that the seeds of the ant-rice were regularly sowed in the autumn, kept weeded during winter and spring, and reaped in summer. Mr. McCook was only able to see the last stage. The plant had certainly been weeded; its seeds were found in the granaries mixed with many others; and, it is admitted "that there is nothing unreasonable, or beyond the probable capacity of the emmett intellect, in the supposition that the crop is

actually sown. Simply it is the Scotch verdict—not proven." This is very unsatisfactory, and as the journey appears to have been undertaken for the express purpose of testing this, the only incredible part of Lincecum's observations, it seems curious that it should have been made in July, at the time of the harvest, instead of in November, the time of the alleged sowing of the crop. If we reject the "sowing" as too improbable, the only other explanation of the facts seems to be that the *Aristida* is one of those singular plants which constantly appear on cleared ground although not growing in the immediate vicinity, and that the ant's clearings prepare the conditions for its growth. A few experiments would soon test this, and it is a great pity some resident could not be found to determine this most interesting point either by observation or experiment. The book is, however, full of valuable matter as to the habits and actions and the whole domestic economy of ants; and there is a useful chapter on "the ancient belief in harvesting ants—how it was discredited and how restored," in which the opinions of many ancient and modern authors are given with a number of suggestive extracts from the classics as well as from the Rabbinical laws and traditions. We cannot, however, but feel some regret that the author did not make more extended observations before writing so voluminous a work, so that he might have been able to clear up the numerous points now left in uncertainty. The chief authority for a number of important statements is still Dr. Lincecum, who appears to have resided for many years in Texas and to have assiduously studied the habits of the ants, and there does not seem to be any essential point in which Mr. McCook's own observations show his predecessor to have been in error. On the contrary he must be considered to have proved the substantial accuracy of the doctor's facts so far as he was able to do so in the limited time at his command.

ALFRED R. WALLACE

## EXPERIMENTAL GEOLOGY

*Études Synthétiques de Géologie Expérimentale.* Par A. Daubrée, Membre de l'Institut, Directeur de l'École Nationale des Mines, &c. (Paris: Dunod.)

MONSIEUR DAUBRÉE has, during the last thirty years, published numerous very important memoirs describing the production, upon a small scale in the laboratory, of various natural geological phenomena. These papers, which were originally scattered through the pages of different scientific journals, are now for the first time brought together. The first part of this work, under the title of "Application of Experimental Methods to the Study of Various Geological Phenomena," forms a handsome and well-illustrated volume of nearly five hundred pages. This is to be followed by a second part, to be entitled "Application of Experimental Methods to Various Cosmological Phenomena," which will describe investigations recently made on the constitution and characteristics of meteorites.

The earlier portion of the volume before us details the results of numerous experiments made with the object of explaining different geological phenomena, of which some are chemical and physical, while others are simply mechanical.