M. W. Lyon presented some 'Notes on the Zoology of Venezuela,' stating that he spent the months of July and August in that country in company with Lieut. Wirt Robinson, collecting zoological material, especially the mammals. On the way down one day was spent at the interesting island of Curaçao, a few miles from the South American mainland. The mammal fauna of this dry and rather barren island consisted of several species of bats and a rabbit. Of the former eight are known to be peculiar, but related to the mainland forms, although one genus, *Leptonycteris*, has never been taken nearer than Central America. We are indebted to Mr. Guthrie, in the United States Weather Bureau Service, for our knowledge of Curaçaoan bats.

On the continent, collecting was confined to the vicinity of La Guaira, at the base of the extensive range of mountains that border the northern coast of South America. The first few hundred feet of hills about La Guaira are remarkably dry and covered with scrubby trees and bushes, agaves and post-cactuses, but at higher elevations where the moisture is greater is an abundant growth of tropical trees, shrubs and vines. The fauna of the dry region is quite different from that higher up, and consists principally of certain species of birds and lizards. Mammals, as well as more or less characteristic birds and reptiles, are apparently confined to the better wooded regions, or in the narrow valleys that the mountain brooks make on their way to the sea. There are no rivers in the neighborhood. Diligent trapping does not result in the numerous small mammals, as in temperate regions or certain places in the tropics. Bats are abundant in species and individuals, and may be found roosting in dense trees, in houses, or in the few small so-called caves in the region. Among the more interesting ones are disc-bats, of the genus *Thyroptera*, with a sucking disc near each wrist and ankle joint, by means of which it can adhere to and move over smooth surfaces as glass, in the manner of a fly, and the vampire, a moderately sized bat with a special dentition and alimentary canal for drawing blood from animals and digesting it. The native or spiny rat, *Loncheres*, while belonging to an entirely different section of the rodents, shows a striking external resemblance to the house rats found about the towns and brought in with the advent of the Europeans. Several other rodents occur and four species of opossums are found, including one of shrew-like form and habits, of the genus *Peramys*.

F. A. Lucas spoke of 'The Deposit of Mastodon Bones at Kimmswick, Missouri,' saying that this extraordinary aggregation of bones and tusks represented hundreds of individuals of all ages and sizes. But a small portion of the deposit had as yet been worked, but from this had been obtained teeth and bones representing between two hundred and three hundred animals. The full paper will appear in SCIENCE.

F. A. LUCAS.

DISCUSSION AND CORRESPONDENCE.

THE RELATION OF THE NORTH AMERICAN FLORA TO THAT OF SOUTH AMERICA.

TO THE EDITOR OF SCIENCE: In the interesting article by Professor Bray on the relations of the North American Flora to that of South America, in your issue of November 9th (pp. 10–11), there are some geological assumptions which are so at variance with the information now attainable that it seems well to call attention to them. It is true that most of them are of ancient date and found more or less accepted in the literature, and that their erroneous character does not materially affect Professor Bray's botanical conclusions; moreover, the present state of our knowledge has been set forth in the annotations to a table of our Tertiary horizons which appeared in the 18th Annual Report, U. S. Geological Survey, Part II, pp. 323–348, 1898. Nevertheless, they are so confidently stated by Professor Bray that it is quite likely that they may be accepted by botanical students and others not especially conversant with geology, and prove less innocuous than in the present case.

In the first place, Professor Bray has been misled by the long continued practice of authors in referring the basal Middle Oligocene of Central America and the West Indies to the Miocene. It was during this period that Central America formed a series of islands and the lagoon islets of south Florida first appeared above the sea. During the Miocene, however,

there is no evidence that any part of Central America which is now above it was below the sea. No true marine Miocene beds have been recognized in any part of the Caribbean, Antillean or Middle American region. Florida alone shows Miocene, not only about the southern borders of the group of islets which formed the nucleus of the present peninsula, but also across the neck of the peninsula; which in Miocene times was a wide, shallow strait between the islands and the mainland of Georgia and has been named the Suwanee Strait.

Secondly, this Oligocene (formerly called Miocene) time was warm, but the true Miocene was a relatively cold period and is marked by a climatic change so sharp that the marine Oligocene fauna was almost wholly driven out of the Gulf and Floridian region, which was invaded by a cool-water fauna from the north, corresponding to the present fauna of New Jersey. The Arctic and Alaskan leaf beds, called Miocene by Heer, are now generally referred to some part of the Eocene column, and in Alaska are overlaid by the cooler marine fauna of the true Miocene. In the Pliocene, on the other hand, at least in Florida and the coast northeast of it as far as Chesapeake Bay and probably to Martha's Vineyard, there was a change to a warmer marine condition, which carried several semi-tropical forms of mollusks as far north as Massachusetts, and was accompanied by a slight subsidence in the Gulf region and on the Central American coast. In Tehuantepec the coastal plain was submerged to a depth of at least 600 feet, though whether the connection between the two oceans was renewed is not yet known. The ice age was, in the Gulf region, ushered in by a slight elevation of the land, and a return to slightly cooler conditions of the sea, but not to as great a degree as during the Miocene, the northern current, if any, being probably diverted off shore or cut off entirely.

Lastly, there is no reason, paleontologically speaking, for believing that the Antilles or the Florida peninsula has ever been connected with South America since the Mesozoic, if at all. On the contrary, there are strong reasons for believing that the insular condition has been maintained in nearly all the islands (excluding Trinidad and those adjacent to it) from an early period in the Eocene to the present day. It is probable that the distribution of the flora can be fully accounted for without resorting to the hypothesis of an unbroken land connection.

WM. H. DALL.
SMITHSONIAN INSTITUTION, November 12, 1900.

PALEONTOLOGICAL NOTES.

THESPESIUS VERSUS CLAOSAURUS.

IN 1856 Dr. Leidy described in the Proceedings of the Academy of Natural Sciences of Philadelphia two vertebræ and a proximal phalanx, for which he proposed the name of *Thespesius occidentalis*, stating that they probably came from some Dinosaur, although they might prove to be mammalian. Comparison of these bones with the similar parts of *Claosaurus annectens* of Marsh shows them to be identical and that consequently this Dinosaur must be known by Leidy's name.

A NEW LOCALITY FOR THESPESIUS.

THE U. S. National Museum has recently received from Mr. Harvey C. Medford, of Tupelo, Miss., the greater portion of the right femur of a large Dinosaur obtained near that place. This femur agrees exactly with the corresponding femur of a large and very complete specimen of *Thespesius occidentalis* collected by Mr. J. B. Hatcher in Wyoming, and certainly belongs to the same genus if not the identical species. This is the most southern locality for *Thespesius*, if not the first record of Dinosaur remains in the State of Mississippi.

THE DERMAL COVERING OF THESPESIUS.

THE impressions of the dermal covering of *Thespesius* (*Claosaurus*), noted by Mr. Hatcher in SCIENCE for November 9th, are of great interest, although they are not the first that have been discovered. Some years ago the U. S. National Museum obtained from Mr. Robert Butler a fine skull of *Thespesius*, together with other bones, and several pieces of sandstone bearing the impressions of small horny scutes, similar to those described by Mr. Hatcher.

THE DENTITION OF BASILOSAURUS CETOIDES.

IN the *American Naturalist* for August, 1894, attention was drawn to the fact that at least the lower molariform series of Zeuglodon contains