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

six teeth, or one more than it is usually credited with. The specimen in the U. S. National Museum shows also that the first upper premolar is not a two-rooted tooth, but a single-rooted canimiform tooth having a very small accessory cusp on the posterior face. The first lower premolar is a large tooth with two roots. A jaw of *Dorudon* collected by Mr. Charles Schuchert seems to show that the Zeuglodonts were diphyodont, for it contains several teeth much smaller than those found in other specimens and these teeth had apparently not been fully extruded.

THE HYOID OF BASILOSAURUS.

ACCOMPANYING the skull obtained by Mr. Schuchert is a series of bones considered as constituting the hyoid. The complete hyoid is much like that of a toothed whale but with very much longer arches. The basihyal is flat beneath, slightly hollowed above, the ceratohyals are immensely long, 35 cm., and quite slender; the thyrohyals are stout at the point of articulation with the basihyal, taper slightly and are 25 cm. in length.

THE CRANIAL CAVITY OF BASILOSAURUS.

A CAST made in the cranial cavity of an imperfect specimen of *Basilosaurus* shows the brain to have been comparatively smooth and of a most extraordinary shape, being very much wider than long, owing to its excessive prolongation in the auditory region. The separation between cerebrum and cerebellum was rather slight, the tentorium being a mere low ridge.

F. A. LUCAS.

FORESTRY IN THE PHILIPPINES.

STRANGELY enough, there comes from our far distant possessions in the Pacific Ocean—which we are apt to think backward in all directions of economic development—a call for technically educated assistants in a branch of economics, which in our own country is only just beginning to be appreciated.

The Forestry Bureau at Manila, which is in charge of Capt. Ahern, U. S. A.—a most energetic officer who took great interest in advocating rational forestry methods for our public domain—is an inheritance from the Spanish government. It was established as long as 35 years ago, and employed 66 foresters, as many rangers and 40 other subordinates supervising the exploitation of the government forest property, which, according to estimate, comprises between 20,000,000 and 40,000,000 acres.

Capt. Ahern writes that he found 'the regulations in force in August, 1898, excellent, practicable and in line with the most advanced forestry legislation of Europe,' so that they could in the main be re-enacted, but, to be sure, the laws and regulations were not fully enforced and scientific forestry not practiced, and "it did not take long to develop the fact that the foresters knew very little of practical forestry, beginning their work after the trees had left the forest, not before, *i. e.*, devoting all their attention to collecting revenues."

At present even a revenue of about $8,000 per month is derived from licensees, who are mainly engaged in collecting guttapercha, rubber, gum, varnish, dye woods (some 17 kinds) and firewood, besides some of the very valuable hard woods.

Over 400 species of trees are known and a more careful survey will bring the number nearer 500. Of these at least 50 are valuable, the Yang-ylang tree being considered among the most important. This furnishes an oil which forms the base of many renowned perfumes. On the island of Romblon, a mass of cocoa palms, the result of planting under a former governor, covers the slopes from sea to mountain top, furnishing a yearly revenue of from one to two dollars per tree.

There are altogether, according to Blanco's magnificent work on the flora of the Philippines, 28 genera of palms with 87 species, the most important of which is *Coryphæa umbellaria.*

There are 22 species of Cupuliferæ, with two oaks (*Quercus costata* and *conocarpa*), and five genera of conifers with nine species; one only true pine, *Pinus insularis*, occurring in dense forests in the island of Luzon, above 4,000 feet altitude.

The families of Rubiaceæ, Rutaceæ, Ebenaceæ and Leguminosæ furnish quite a large number of arborescent species. Coffee trees grow wild on the slopes, replacing the original growth, when invaded by the wood chopper.