ART. XXVI.—*A Middle Eocene Member of the "Sea Drift";*
by EDWARD W. BERRY.

STUDIES made during the past few years have brought to light extensive fossil floras in southeastern North America which range in age from the lower Eocene to the Pliocene. Practically all of these are coastal floras and the bulk of the plants discovered belong to the strand flora and comprise many plants whose fruits or seeds are normal constituents of the sea drift and are distributed mainly by ocean currents. Among these are such striking forms as the Nipa palm, *Dodonæa*, *Sapindus*, *Sophora*, *Rhizophora*, *Conocarpus*, *Avicennia*, etc. These Tertiary floras, partially published,* indicate progressively warmer climates commencing with the lower Eocene and culminating in the lower Oligocene, at which latter time tropical climates prevailed throughout this region.

Some years ago I received from Mr. Otto Veatch a striking seed collected by him from the middle Eocene of western Georgia. This has remained undescribed until now, but as it represents such a well-defined type of seed of the tropical or sub-tropical sea drift and a type not heretofore represented in the fossil state by seeds, it seems worthy of a brief note. It is referred to the genus *Carapa* of the family *Meliaceæ* and may be characterized as follows:

Carapa xylocarpoides sp. nov.

Seed of large size, somewhat trapezoidal or pyramidal in outline, tapering toward the hilum, rounded distad. Length about 3.5^{cm}, maximum width about 3.5^{cm}, thickness about 6^{mm}. The lateral margins are rounded. The distal margins tend to be somewhat angular and there is a more or less pronounced angular ridge on the proximal face of the seed. The outline and the degree of rounding or angulation and the variability are the results of mutual pressure of the seeds of a head, and the range of variation among existing forms is considerable. The texture is ligneous and the seeds obviously formed part of the middle Eocene sea drift and are contained in marine sediments.

This striking form is unquestionably referable to the modern genus *Carapa* Aublet or to the allied genus *Xylocarpus* König and Jussieu, the latter often made to include two existing oriental species frequently referred to *Carapa*, especially in the older literature. The differences between the two genera are

* Berry, E. W., Lower Eocene Floras of Southeastern North America, U. S. Geol. Survey, Prof. Paper 91, 1916.

FIG. 1a.

FIG. 1b.

those of floral structure, degree of buoyancy of the seeds, and manner of dehiscence of the fruit, characters upon which the fossil sheds but little light. The seed coat of *Carapa* is woody while that of *Xylocarpus* is corky and consequently more buoyant and better adapted for dispersal by ocean currents. In this feature the fossil seed seems more like those of *Xylocarpus*. In form *Xylocarpus* seeds are somewhat more regularly pyramidal than those of *Carapa* and in this respect also the fossil is more like *Xylocarpus*, especially the oriental mangrove *Xylocarpus obovatus*, a seed of which is shown in fig. 1*b*.

However, in considering an American Tertiary form and recalling that *Carapa* is much the better known generic term even for the oriental mangrove and other modern species of both *Carapa* and *Xylocarpus*, and that *Carapa* is represented by foliage in the lower Eocene (Wilcox) flora of this general region,* it seems advisable to adopt the generic term *Carapa* for the fossil, since it can hardly be more closely related to the oriental mangrove *Xylocarpus obovata* Blume or the oriental beach plant *Xylocarpus moluccensis* Lamarck than to the half dozen existing species of the American and west African tropics. The absence of the more or less massive seeds of the various existing species in our larger herbaria is my excuse for not making more detailed comparisons between them and the present fossil form.

The locality where the fossil was collected is $2\frac{1}{2}$ miles east of Fort Gaines, Clay County, Georgia, and it came from the marine clays of the middle Eocene (Claiborne). The fossil is shown natural size in fig. 1*a* and a somewhat larger seed of the oriental *Xylocarpus obovata* is shown in fig. 1*b*.

Johns Hopkins University,
Baltimore.

* Berry, op. cit., p. 253, pl. 55, fig. 4.