PALEONTOLOGICAL NOTES

THE UPPER CRETACEOUS AGE OF THE ORBITOIDAL GENUS
GALLOWAYINA ELLIS¹

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ABSTRACT

The type locality of Gallowayina was visited and a careful examination of the stratigraphy and fauna indicates the Upper Cretaceous age of the beds.

Gallowayina, a genus of orbitoidal foraminifera, was recently described by Dr. Ellis² from a collection of fossils made in Cuba many years ago by Mr. Barnum Brown. The holotype is reported to have come from the "Upper Eocene orbitoid series immediately overlying the Cretaceous, on the Anaya River 1 kilometer below Bahía de Ciego Montero."³

Intensive geological exploration of the island during the past four years has provided abundant fossil material from both the Upper Cretaceous and Upper Eocene. Gallowayina is a common and characteristic genus in the Upper Cretaceous fauna. It is also widely distributed geographically, having been found in four of the six provinces of the republic. The accompanying fauna comprises Omphalocyclus macropora (Lamarck), Orbitoides palmeri Gravell, Cretaceous echinoids, Pecten (Vola), rudistids and rudistid fragments and numerous small foraminifera among which are the characteristic Cretaceous genera Gümbelina, Globotruncana, Planoglobulina and Pseudotextularia.

The undoubted Upper Cretaceous age of Gallowayina at all known localities throughout its wide geographic range cast grave doubt on the Upper Eocene age determination of the type locality. The type locality was visited and careful collections were made.⁴

Gallowayina is abundant in the white marly limestone outcropping on the north side of Anaya River at the Finca Niagara road crossing, 1 kilometer west (downstream) from Baños de Ciego Montero⁵ station on the United Railways of Cuba.

¹ The author is greatly indebted to Dr. R. E. Dickerson, Chief Geologist of the Atlantic Refining Company of Cuba, for his guidance in the interpretation of the stratigraphy of this locality and his constant encouragement of micropaleontological studies in Cuba.

² Baños de Ciego Montero is a classic locality of Cuban naturalists. One of the springs yielded the remains of the ground sloths Megalocnus rodens (Leidy) (or Myomorphus cubensis Pomel) and Mesocnus browni Matthew, the crocodile Crocodylus pristinus Leidy and the turtle Testudo cubensis. See De la Torre, Carlos, Osamentas fosiles encontradas en las casimbas de la Sierra de Jatibonico... Revista de la Facultad de Letras y Ciencias, Habana, 1910; Matthew, W. D., Genera and the new species of ground sloths from the Pleistocene of Cuba; Am. Mus. Novitates, no.

¹ Published with permission of the Atlantic Refining Company of Cuba. See the following paper by T. Wayland Vaughan which points out that Gallowayina is a synonym of Orbitoides.—Editor.

² Ellis, B. F., Gallowayina browni, a new genus and species of orbitoid from Cuba, with notes on the American occurrence of Omphalocyclus macropora; Amer. Mus. Novitates, no. 568, pp. 1–8, 9 figs. in text, Sept 22, 1932.

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Havana branch line to Cienfuegos, Santa Clara Province, Cuba.

The topography of the country around Baños de Ciego Montero is almost flat or very gently undulating and the best clues to the underlying strata are found in the occasional river and railroad cuts. A finely conglomeratic rock (graywacke?) composed largely of igneous rock debris in a calcareous matrix dominates the terrain and outcrops in Anaya River for approximately a kilometer westward (downstream) from Baños. At this point there is a small cascade in the river formed by Cretaceous limestone. Fifty-five meters westward from the cascade the road to Finca Niagara crosses the river. The finely conglomeratic rock of igneous debris and interbedded pale-green siliceous tuff outcrop in the streambed and in the road at the crossing. Immediately to the westward the river has cut a small gorge through the Cretaceous limestone. At the road crossing the strike and inclination of the Cretaceous limestone and the underlying series of finely conglomeratic igneous debris rock (or graywacke?) and interbedded siliceous tuff may be clearly seen. Both are striking north 55° east and dip to the northwest, the former at an angle of 8 to 12 degrees, the latter from 40 to 50 degrees.

The only fossil found in the finely conglomeratic igneous debris rock was a fragment of echinoid spine. This is of value chiefly as an indication of the marine origin of the deposit.

In the road on the north side of the river the marly, highly fossiliferous white limestone is well exposed. The fauna comprises Gallowayina browni Ellis, Meandropsina n. sp., an Operculina-like rotalid (new genus), two types of echinoid spines (both of which have been found elsewhere in characteristically Cretaceous assemblages), Pecten (Vola), a few poorly-preserved small foraminifera and ostracodes, a poorly-preserved rudistid fragment and an echinoid. The generic assemblage is small but entirely Upper Cretaceous in aspect. There are no elements in it suggesting Upper Eocene age which might be interpreted as indicating a reworked Cretaceous fauna in an Upper Eocene deposit. The genus Omphalocyclus, listed by Dr. Ellis from this locality, was not found. Judging from the statement "These individuals represent the only occurrence of this genus and species in the western hemisphere... Both specimens are of the megaspheric form..."6 it was rare in the original collection from this locality. Omphalocyclus is, however, very common in the Upper Cretaceous in Cuba and accompanies forms as definitely Cretaceous in age as does Gallowayina.7

On the south side of Anaya River, stratigraphically above the white limestone is a small outcrop of soft yellow marl. No satisfactory dip could be obtained.

That the yellow marl lies stratigraphically above the white limestone is evidenced by the absence of outcrops in the river and the presence of large pools where the outcrops should appear. Between the cascade formed by the first outcrop of the Cretaceous limestone and the road crossing there is a large quiet pool in the river and beyond the gorge cut in the Cretaceous limestone just west of the road crossing the river opens into another large pool where the marl should have outcropped above the limestone.

The fauna of the yellow marl is likewise Upper Cretaceous in age. It comprises several species of ostracodes, Exogyra, echinoid spines similar to one of the types found in the white limestone, a small and very distinctive species of scaphopod (?Hamulus) which is common in Cuban Cretaceous assemblages at

7 One of the most accessible localities at which Gallowayina and Omphalocyclus may be obtained in abundance is the northeast corner of Sitios and Franco Streets in the city of Havana.

many localities, Operculina-like rotalids, and occasional small foraminifera, among which are the genera Gümbelina, Globotruncana and Planoglobulinia. Only three specimens of Gallowayina were found in the yellow marl. The most abundant foraminifer in the assemblage of the yellow marl is the operculine-like rotalid which was noted in the fauna of the white limestone. This new genus has been found elsewhere in Santa Clara Province associated with characteristically Upper Cretaceous genera of small foraminifera, the orbitoid Orbitocylinia cf. O. nortoni Vaughan and rudistids.

No Eocene rocks were encountered in this immediate area and there is no evidence to support the suggestion that the fauna was derived by erosion of Upper Cretaceous rocks and deposited in sediments of Upper Eocene age.

The fauna of the marly white limestone is poor in species though rich in individuals of Gallowayina browni Ellis. The Upper Cretaceous age is evidenced not only by the faunal assemblage but, more satisfactorily, by its identity with assemblages in undoubtedly Upper Cretaceous strata in many parts of Cuba, where very frequently a greater diversity of genera and species has been encountered.

A NOTE ON ORBITOIDES BROWNII (ELLIS) VAUGHAN

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Mr. Brooks Fleming Ellis has recently published an article entitled "Gallowayina brownii, a new genus and species of orbitoid from Cuba, with notes on the American occurrence of Omphalocyclus macropora." Unfortunately, Gallowayina is a precise synonym of Orbitoides d'Orbigny, genolectotype O. media (d'Archiac). The genoholotype of Gallowayina, G. browni, is closely related to Orbitoides apiculata Schlumberger, a species common in the Upper Cretaceous of south-central and southern France and at Maestricht, Limburg, Holland. Apparently Mr. Ellis did not compare his descriptions and illustrations with those of Orbitoides, otherwise he would have recognized that he was repeating in his characterization of Gallowayina the diagnostic features of Orbitoides. He says regarding the nucleoconch:

In vertical section the nucleoconch may present various appearances, according to the orientation of the section, but in reality it is quadrilocular, the group of four chambers being surrounded by a heavy fibrous wall, with the fibers normal to the surface...

In horizontal section the nucleoconch appears quadrilocular, the small initial chamber being followed by a larger kidney-shaped one and the two bounded on either side by a hemispherical chamber.

After the description of G. browni it is said that:

This form appears to be the American analogue of Clypeorbis mamillata (Schlumberger). It differs from the European form in many important respects, however. The megaspheric nucleoconch of Clypeorbis is a trochoid spire, while that of Gallowayina is quadrilocular. Then, too, the American form is more conical than the European genus, and there is marked difference in the form and arrangement of the median chambers. Also the median zone of the Cuban form is more dome-like than that of Clypeorbis.

H. Douville says regarding the embryonic chambers of Orbitoides:

Cet embryon quadriloculaire caractérise les formes les plus anciennes O. tissoti (fig. 1); il se retrouve presque sans modification dans O. media, un peu plus récent, du Dordonien.