

ALPENA LIMESTONE STAGE, Grabau ('02, p. 175)

The authors recognize Ver Wiebe's ('10, p. 185) redefinition of the limits of the Alpena limestone, with the exception of the "black Alpena" zone which is separated below as the Killians limestone. The Dock Street clay of Grabau ('02, p. 192) is a local clay facies of the upper Alpena horizon.

LONG LAKE STAGE, Grabau ('02, p. 184)

Killians limestone, new name

Dark gray to black limestone with black shale layers. Overlain by gray and brown granular beds of Alpena limestone, and underlain by gray shales and limestones of the Genshaw formation. Greatest measured thickness, twenty-three feet. Type locality, exposures along French road, one-half mile south of the Killians resort, Long Lake, Alpena County, Michigan.

Genshaw formation, new name

Four persistent thin gray limestone beds, alternating with gray calcareous shales, all containing a large species of *Atrypa* and *Gypidula romingeri*. Overlain directly by black Killians beds, and underlain by clay shales of the Ferron Point formation. Measured thickness, fifty-one feet. Type locality, region around the Genshaw school, sec. 13, T. 32 N., R. 8 E., Alpena County, Michigan.

Ferron Point formation, new name

Green to bluish clays, interbedded with argillaceous limestones, all carrying an abundance of fossils. Overlain directly by the calcareous shale of the Genshaw formation and underlain by the Rockport limestone. Thickness, approximately thirty-five feet. Type locality, Rockport quarry, Rockport, Alpena County, Michigan.

ROCKPORT LIMESTONE, R. A. Smith ('16, p. 175)

BELL SHALE, Grabau ('02, p. 191)

Base of the Traverse group in Alpena region.

PALEONTOLOGY.—*Further notes on fossil larval chambers of mining bees.*¹ ROLAND W. BROWN, U. S. Geological Survey.

Since the publication of my first paper on this subject,² I have learned several important additional facts that merit statement and necessitate changes in the nomenclature applied to those fossils.

First, it was discovered that in 1907 some similar but more fragmentary fossils, lacking the spiral apices, were described by E. Schütze³ as the fillings of bee chambers under the name *Anthophora*

¹ Published by permission of the Director, U. S. Geological Survey. Received July 24, 1935.

² BROWN, ROLAND W. *Celliforma spirifer, the fossil larval chambers of mining bees.* This JOURNAL 24: 532-539, text figs. 1-5. 1934.

³ SCHÜTZE, E., in W. BRANCA and E. FRAAS. *Die Lagerungsverhältnisse Bunter Breccie an der Bahnlinie Donauwörth-Treuchtlingen und ihre Bedeutung für das Riesproblem.* K.-preuss. Akad. Wiss. Abh., Heft 2: 25-26, plate (opp. p. 56), figs. 22, 23. 1907.

Podalirius)? sp. Like Dall, Schütze observed a superficial resemblance of the fossils to fillings of pholad burrows but, unlike Dall, dismissed the pholad suggestion as unacceptable and referred the fossils to fillings of chambers made by an anthophorid bee. However, in this instance as with the Wyoming and Florida fossils also, because no remains of the insects themselves were found, and because it is not conclusively proved that the fossils are related to mining bees, although the circumstantial evidence points strongly in that direction, the reference to the particular genus *Anthophora*, it seems to me, is not an especially happy one.

Second, because differences between the specimens from Wyoming and those from Florida are discernible, as was pointed out in my first paper, it will clarify matters to distinguish two species. I therefore propose that the term *Celliforma* be the generic name to include all fossil fillings of chambers purporting to have been made originally by unknown mining Hymenoptera, and I designate *Celliforma spirifer* Brown, from the Bridger formation of Wyoming, as the genotype. The specimens from the "silex beds" of the Tampa limestone of Florida may be known as *Celliforma nuda* (Dall) Brown, new combination, and Schütze's specimens, from the Oligocene of Weilheim, Germany, as *Celliforma germanica* Brown, new name.

Third, several more new references to the literature on mining Hymenoptera indicate that other observers have also noted the spiral construction used by these bees in sealing their larval chambers. Friese⁴ alludes to this structure in his discussion of *Anthophora*, and Rau,⁵ discussing the carpenter bee (*Xylocopa virginica*), describes the nest construction and gives an excellent illustration of the spiral sawdust seal made by that species. The use of the spiral seal by *Emphor fuscojubatus* is illustrated in many newly-made chambers exhumed on July 18 and 21, 1935, Second and T Streets N. E., Washington, D.C. Incidental to the collection of these chambers, it was observed that, 1. This species of *Emphor* selects the site for a burrow, softens the hard soil with frequent applications of jets of water imbibed from the surface of the adjacent pool, and within 30 minutes constructs an entrance turret 1 centimeter high. 2. In less than 4 days she completes the burrow from 5 to 10 centimeters deep, fashions the larval chamber, fills it with the lemon-yellow pollen from the shrubby althea (*Hibiscus syriacus*), lays an elongated, pearly white

⁴ FRIESE, A. *Beiträge zur Biologie der solitären Blumenwespen (Apidae)*. Zool. Jahrb. Abt. für System. Band 15: 818 ff. 1891.

⁵ RAU, PHIL. *Jungle bees and wasps*, pp. 244-245, fig. 100. 1923.

egg on the bottom of the pollen mass, seals the chamber, packs the rest of the burrow with pellets derived from the turret, and closes the entrance with a smooth, saucer-shaped plug. 3. The pollen mass ferments, darkens somewhat and assumes a pasty consistency; and the larva, from the time of hatching, apparently occupies less than a week in consuming this stimulating nourishment and attaining its maximum length of about 1.5 centimeters.

Finally, the now accepted name *Melitoma* should be substituted for *Entechnia* in my former references to *Entechnia taurea*.

BOTANY.—*A new tree-fern from Trinidad.*¹ WILLIAM R. MAXON, National Museum.

The new species described herewith is one of the most interesting among the rich collections of Trinidad ferns received from the Venerable Archdeacon A. Hombersley in recent years. It is named with much pleasure in honor of its discoverer.

Hemitelia Hombersleyi Maxon, sp. nov.

Species *H. Wilsoni* affinis, sed tamen optime distinguenda, differt enim pinnis linearibus, pinnulis multo minoribus, obtusis (nec acuminato-attenuatis), et lobatis (nec pinnatifidis), lobis et serraturis parvis, venis paucis, paleis costae et venarum brunnescentibus nec albis, soris minimis, et indusiis pallide brunneis, nec albidis.

Rhizome an erect caudex about 60 cm. long and 5 cm. in diameter; scales tufted-imbricate, about 1.5 cm. long, 3 mm. broad at the lanceolate basal portion, attenuate-subulate, light brown, concolorous, the margins lightly erose-scarious. Fronds several, erect-arching, 1.5–2 m. long, the stipes short (30–40 cm. long), brown, slender, 1–1.5 cm. thick, freely beset with straight, narrowly conical, pungent spines 1–3 mm. long, paleaceous on inner face, the scales subovate, acuminate, 5–10 mm. long, mostly subfalcate, thin; blades about 1.5 m. long, 75 cm. broad at middle, broadly oblong, abruptly acuminate at apex, subbipinnate; pinnae about 18 pairs, opposite, slightly apart, linear, acuminate at apex, the two basal pairs short-stalked (5–7 mm.) and strongly deflexed, those above laxly horizontal, 30–38 cm. long, 5–7.5 cm. broad, subsessile, evenly pinnatifid almost to the costa nearly throughout, pinnate at base; costae thinly hirtellous above, glabrate beneath and bearing a few thin broad brownish appressed deciduous scales; pinnules or segments 20–25 pairs below the lobate-serrate acuminate apex, the 2 or 3 basal pairs sessile or subsessile, the others fully adnate and lightly joined by a narrow decurrent wing, more broadly so toward the apex; segments in general 2.5–2.8 cm. long, 6–10 mm. broad, oblong, obtuse or acutish, strongly falcate, subentire in basal portion, broader and pinnately lobed toward apex, the lobes oblique, obtuse, 2–2.5 mm. broad, 1–2 mm. long, varying according to fertility; costules delicate, elevated, glabrate, bearing a few thin brownish scales beneath; veins about 16 pairs, free, those of the

¹ Published by permission of the Secretary of the Smithsonian Institution. Received October 12, 1935.



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