ART. XIX.—*The Devonian of Central Missouri* (II); by
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In the type locality of the Craghead Creek shale, section 17, township 46, range 9 west, Callaway county, the youngest member of the section is a light-colored, sandy shale, carrying an abundant series of pelecypods, few corals and bryozoa, with an association of brachiopods, never abundant, of the following species: *Productella callawayensis*, *Schizophoria striatula* (a large variety), *Spirifer iowensis*, *Cyrtina triquetra*, *Atrypa reticularis* (with coarse ribs and extravagantly developed growth varices). The pelecypods, which for the most part are undescribed forms, comprise the following genera: *Palæoneilo*, *Edmondia*, *Actinopteria*, *Grammysia*, *Schizodus*, *Pterinopecten*, *Paracyclas*, and *Goniophora*.

The Cow Creek Section of the Craghead Creek Shale.

About fifteen miles northeast of this former locality, in section 25, township 47, range 8 west, on the divide between Auxvasse and Loutre rivers, a small, sharp anticline, cut almost at right angles by Cow Creek, gives a fine exposure of Craghead Creek shale, which for the most part is made up of beds younger than those exposed in the type locality. The thickness of the Devonian exposed in this locality is somewhat over twenty feet; the section, measured from the top to the creek bed, is as follows:

Zone No. 1. A fine-grained, chocolate-colored, paper shale, never abundantly fossiliferous and frequently quite ferruginous; the known fossils from this zone are species common to the shales below and comprise the following forms: *Athyris minima* Swallow, *Spirifer amarus* Swallow, *Lioclema occidentens* H. & W., *Cladopora prolifica* H. & W., and large masses of *Stromatopora*.

Thickness 0-36 inches.

Zone No. 2. Hard limy shale, gray in color, fossils frequently silicified, crushed and water-worn; *Stropheodonta callawayensis* Swallow (common), *Productella callawayensis* Swallow (common), *Spirifer euruteines* Owen (rare), *Cyrtina triquetra* Hall (rare), *Schizophoria striatula iowensis* (rare), *Zaphrentis* sp. (common), two species of *Aulopora* (rare).

Thickness 12 inches.

Zone No. 3. Yellow-brown, sandy shale, almost barren of fossils; pelecypods, two species (rare), gastropods, casts of

three species (rare), *Spirifer euruteines* Owen (rare).

Thickness 48 inches.

- Zone No. 4. Yellow, soft, limy shale, very fossiliferous; *Zaphrentis* sp. (common), *Spirifer euruteines* Owen (exceedingly abundant), *Camarotoechia* sp. (rare), *Atrypa reticularis* (rare), *Schizophoria striatula iowensis* (rare), *Cyrtina triquetra* (rare).

Thickness 20 inches.

- Zone No. 5. Iron-stained, gray, shaly limestone, made up almost entirely of fragmentary *Schizophoria striatula iowensis*. This layer is harder and breaks down in large blocks which do not weather nearly so rapidly as the beds above and below; *Schizophoria striatula iowensis* (quite abundant), *Stropheodonta callawayensis* Swallow (common), *Camarotoechia* sp. (rare), *Orbiculoidea* sp. (rare), *Aulopora* sp. (rare), *Zaphrentis* sp. (rare).

Thickness 10 inches.

- Zone No. 6. Fine-grained, bluish, limy shale, fossils abundant; pelecypods, 14 species, mostly undescribed forms, *Orthoceras* sp. (rare), *Spirifer iowensis* Owen (rare), *Atrypa reticularis*, large form (rare).

Thickness 10 feet to creek bed.

Of the abundant pelecypods from zone No. 6, the following genera are identified, those most abundant being given first: *Paracyclas*, *Palæoneilo*, *Schizodus*, *Edmondia*, *Grammysia*, *Actinopteria*, *Pterinopecten*, *Goniophora*. Brachiopods are quite rare in this zone, but the two species recorded are forms that occur only in the uppermost layers of the shale, in the type locality. However, with the evidence offered by the pelecypods alone, the correlation of this zone with the top of the Craghead Creek exposure can scarcely be questioned, especially when the very similar lithologic character of the beds is taken into consideration.

It is interesting to note in this connection that ten species from the upper beds of the Craghead Creek shale are seemingly identical with forms described by Doctor Cleland in Bulletin No. 21 of the Wisconsin Geological and Natural History Survey, as follows: *Orbiculoidea telleri* Cleland, *Liorhynchus greeni* Cleland, *Camarotoechia scitulus* Cleland, *Cranæna iowensis* (Calvin) (figs. 8 and 9 only), *Edmondia fragilis* Cleland, *Goniophora obtusiloba* Cleland, *Pterinopecten telleri* Cleland, *Grammysia nodocostata* Hall, *Ptyctodus calceolus* N. & W., and *Ptyctodus ferox* Eastman.

Fulton, Mo.