

Summing up the facts, then, in few words these rocks are of limited occurrence, covering a few hundred acres all told; they are found at rather low elevations in the hills though they sometimes occur as far as the very tops of the highest points in the ridge country; they have yielded fossils of lower or eocene tertiary age; they have probably resulted from weathering processes; are metamorphic in character; and have no history of dynamic origin or of present or past dynamic change. Their former reference to the paleozoic is no longer tenable and they stand as a unique instance of the induration of soft sandstones in the southwest.

The sketch map accompanying gives that portion of Crowley's Ridge in which indurated sandstones have been found. It will serve to indicate the relations of the ridge to the low-lying country surrounding as well as helping to make clear the geographic distribution of the quartzites.

THE WHITE CLAYS OF INDIANA. By AMOS W. BUTLER. Published in the Trans. of the Ind. Horticultural Soc. for 1893.

BIOLOGY.

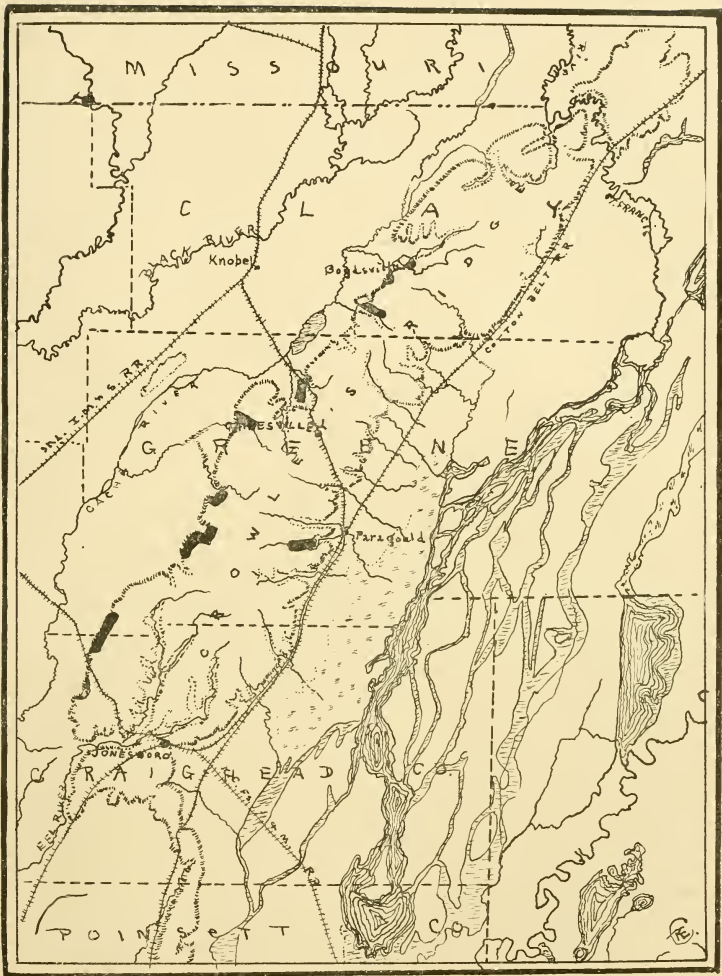
ON THE HABITS OF TURTLES. By A. W. BUTLER.

[ABSTRACT.]

In the White Water valley the soft-shelled turtles are never found active in winter. They seem to seek the deepest water and then bury beneath the surface of the mud or sand. They disappear earlier in the fall and reappear later in the spring than the hard shelled forms. They rarely appear before April 15th, and sometimes not until about May 1st. In the canal none have ever been found in winter. Possibly they seek the deeper water. The hard-shelled turtles winter in the more shallow water, and seem to prefer a mud bank where a musk rat hole has caved in. There they may be found by prodding with an iron rod.

ON THE OCCURRENCE OF KIRTLAND'S WARBLER (*Dendroica kirtlandi* Baird) IN INDIANA. By A. B. ULREY.

Owing to the rare occurrence of Kirtland's Warbler in North America and the fact that its life-history is almost entirely unknown, considerable



NORTH HALF CROWLEY'S RIDGE

Metamorphosed Sandstones. (Eocene).

interest attaches to the presence of the bird in Indiana. At the time of publication of their "History of North American Birds" in 1874, Baird, Brewer and Ridgway gave the locality as the eastern provinces of the United States and the Bahamas. "It must be considered" they state "as one of the rarest of American birds. Kirtland's Warbler is so far known by only a few rare specimens as a bird of North America and its biography is utterly unknown." Three specimens are then recorded as taken, two from Cleveland, O., and one at sea between the islands of Abasco and Cuba.

Dr. Elliott Coues in his "Key to the Birds of North America" published in '84 gives the locality as "Eastern United States." Of its occurrence he states that it is "the rarest of the Warblers; only about a dozen specimens known thus far."

Its habitat is given as "Cuba" by Ridgway in his "Manual of the Birds of North America" published in 1887.

Because of its occurrence in the adjoining states, Ohio and Michigan, Mr. A. W. Butler in his "Catalogue of the Birds of Indiana" places Kirtland's Warbler in his hypothetical list.

There is no record, so far as I can learn, of its occurrence in Indiana other than the present one. The bird is known to me only by a single specimen that was taken May 4th, '93 and handed to me the following summer for identification. It proved to be the rare *D. kirtlandi*. The skin is now in the collection of Mr. W. O. Wallace, Wabash, Ind., who took the bird near his home. Concerning its habits, he says: "I took it in a thicket. It was by itself, there being no other birds in the thicket. It seemed to be an active fly catcher, not having the motions of the other *Dendroica*, being less active. It would dart off after an insect and then return to the same perch."

THE GEOGRAPHIC AND HYSOMETRIC DISTRIBUTION OF NORTH AMERICAN VIVIPARIDÆ. By R. ELLSWORTH CALL.

[ABSTRACT.]

There are four genera of this family in American waters and these exhibit a varying number of species. The paper recognizes *Campeloma*, *Vivipara*, *Lioplax* and *Tulotoma*. There is given the general range of each