determine the difference in level between the two points. For assistance in this work I am indebted to Mr. C. E. Siebenthal and Mr. George Champ. The distance between the two points was estimated by stadia measurement. A reduction of the data obtained showed the points to be 1½ miles apart, and the dip of strata between them to be at the rate of 63.6 feet to the mile. This result was so much larger than was anticipated that the ground was gone over a second time by Mr. Champ and myself. The second survey, with a "Y" level, confirmed the correctness of the first, thus showing the Keokuk strata to have a dip west of nearly 64 feet to the mile in the neighborhood of Bloomington.

Wave Marks on Cincinnati Limestone. By W. P. Shannon.

In the southwest part of Franklin County, three miles west of Oldenberg, in the bed of Salt Creek, are good examples of wave marks on Cincinnati limestones. These wave marks are nothing new. They have been referred to by different students of the Cincinnati strata, and are characteristic, since they occur at all horizons of the Cincinnati rocks. This does not signify that every stratum or layer is so marked, but that such marks are rarely found in other than the Cincinnati limestones. Another stratigraphic character of the Cincinnati rocks is the alternation of strata of limestone and shale. The strata are thin, each one being usually made of a single layer or ledge.

Within a distance of one-quarter mile up and down the bed of the creek, four wave-marked strata are exposed, and according to the law of the Cincinnati formation, each one is overlaid by a stratum of shale. Of these four wave-marked strata the three uppermost are consecutive, not consecutive strata, but consecutive limestone strata.

In no two strata are the wave marks in the same direction or of the same size. All four of these strata are fine grained, compact limestone, showing that they were made of calcareous sand or mud. A description of two of these wave-marked strata will be sufficient, the two which have the greatest exposure. One forms an uninterrupted floor to the stream for a distance of 100 feet; the width of this floor is 25 feet. The wave marks are transverse to the course of the stream, and if we stand at the lower end of this area and look up stream it is hard to keep from thinking that we are looking at real undulations in water. It requires a conscious effort to keep from identifying the effect with the cause. If we measure these waves, they are about two feet from crest to crest, with a vertical distance of about three inches from crest to hollow. Besides wave marks this ledge shows mud

cracks, which have checkered the surface into roughly hexagonal areas. The existence of mud cracks in limestone is a valuable note. In the American Geologist, Vol. IV., No. 6, is an engraving of a slab of Cincinnati limestone, showing mud cracks. The specimen was found by Prof. C. W. Hargitt near Moore's Hill, and is now in the Moore's Hill College. The association of mud cracks and wave-marks in the same ledge is, no doubt, a valuable note in working out the conditions which gave rise to alternating sediments of limestone and shale. The wave-marks are evidence that the sea was so shallow that slight undulations touched bottom. The mud cracks are evidence of some form of land, a low tide island, at least. The two together seem to show a marked shallowing of the sea during the history of one limestone stratum, or a transition from lime-depositing to shale-depositing conditions.

The other wave-marked stratum to be described presents a surface of exposure about 100 feet by 50 feet. The waves are about three feet from crest to crest, and the hollows are about three inches deep. These wave marks differ from those of the other three strata in that they are curved like rainbows. These curved waves are evidence that the undulations of water that caused them were modified by neighboring shoals or land, the results of a shallowing sea.

In this paper I have given only certain facts of structure and have assigned what I believe to be the immediate causes of these structures. The great problem of the Cincinnati formation is the invariable alternation of limestone and shale strata. The structure noted may be helpful in working out this problem.

Structural Geologic Work of J. H. Means in Arkansas. By J. C. Branner.

Correlation of Silurian Sections in Eastern Indiana. By V. F. Marsters and E. M. Kindle.

Some New Indiana Fossils. By C. E. Newlin.

Extinct Fauna of Lake County. By T. H. Ball.

The object of this paper is to present, so far as is known, some account of animals, supposed to be native, that no longer are found in the county of Lake.

1. I may as well name first one that has surely been extinct quite a number of years, the mastodon, remains of which were found near an old beaver dam