nal; about ten of the ordinary or smaller sized cells occupy the space of one line. None of the specimens examined exhibit minute interstitial tubuli. Under surface not observed.

This is a very beautiful species, which can readily be distinguished from the other discoidal species of the genus, by its very broad, low monticules, and the regular arrangement of the cells, as well as by the large size of those occupying the monticules.

Formation and locality: occurs at an elevation of about three hundred and fifty feet above low water mark in the Ohio river, in the Cincinnati Group, at Cincinnati, O.


DESCRIPTION OF A TRILOBITE FROM THE NIAGARA GROUP OF INDIANA.

BY E. O. ULRICH.

CALYMENE NASUTA, n. sp.

[Ety.—Nasutus, snouted.]

General outline sub-ovate, the breadth and length being respectively as five to seven; convexity just anterior to the pygidium about three fourths the width at that point; convexity at anterior portion of thorax and of cephalic shield as one to three or four.

Cephalic shield, without the remarkable proboscis or frontal extension, sub-semielliptical, approaching sub-lunate; the anterior border being more or less regularly rounded, and the posterior somewhat sinous; posterior lateral extremities abruptly rounded or sub-angular; glabella prominent and strongly defined from the cheeks and front margin by deeply impressed furrows; the two posterior pairs of lobes are distinctly defined by deep lateral furrows, which, especially in the posterior pair, pass almost completely around the lobes; the latter are about twice as large as the former, while the anterior pair are very small, all being nearly round; central portion of glabella much wider at base of frontal prolongation than at the neck furrow, which is well defined; neck segment prominent, slightly larger than the first thoracic segment, and considerably arched forward. Front margin recurved, remarkably extended upward and forward, in the form of a compressed and blunt cone, or the superior margin may be more rounded; the length of this proboscis varies, according to the size of the specimen,
from three eighths to five eighths of an inch. Eyes small, rather prominent, and situated opposite the middle lateral lobes of the glabella. Movable cheeks, with rounded and very thick lateral margins, defined by a distinct marginal furrow, which is continuous with that separating the frontal extension from the anterior end of the glabella; here the furrow is very narrow and deep. Fixed cheeks provided with a deep, broad, furrow along the posterior margin. Facial sutures directed forward anteriorly to their intersection of the margin in nearly parallel lines; posterior to the eyes they bend toward the glabella, then abruptly outwards, and run nearly parallel with the posterior margin of the shield to a point about one half the distance from the lateral
margin of the head to the glabella; from this point they pass in a slightly curved direction to a point a little within the posterior lateral angle of the cheeks. Frontal suture passing from the intersection of the facial suture and the anterior margin on one side, upward on the front face of the proboscis to a point about midway the length of the same, where it bends at a right angle and proceeds to the intersection of the facial suture on the other side. Labrum not observed.

Thorax with thirteen segments, narrowing backward and about one sixth longer than wide; mesial lobe not as wide as the lateral, very prominent and depressed on top, with the segments strongly defined and arched forward in the middle and at their ends. Lateral lobes flattened on the inner third, then strongly rounded off until the direction to the lateral margin is nearly at right angles to that in the inner third; pleura slightly curved backward to their outer ends, which are rounded, compressed, expanded, and provided at their posterior edge with a thickened marginal ridge, which becomes gradually stronger to their junction with the segments of the mesial lobe; each provided with a well-defined longitudinal furrow; on the inner third, and just anterior to the furrow, there is a rather prominent ridge which is placed behind, and usually in contact with, the next succeeding segment.

Pygidium a little wider than long, and as long as the middle of the cephalic shield, exclusive of the frontal prolongation; a direct posterior view shows the outline to be semi-circular or broadly semi-ovate, the base appearing straight; viewed from above it is more or less sub-trigonal; mesial lobe well defined, depressed convex, and extending at least three fourths the distance to the posterior margin, showing four segments, and very obscurely a fifth; behind these there is a sub-triangular space that is not segmented. Lateral lobes sloping off very rapidly, each with four segments, all of which have a slightly defined longitudinal furrow. Lateral and posterior borders with a thick margin, which on the exterior is only conspicuous beneath the last segment of the mesial lobe.

Dimensions of a medium-sized specimen: entire length, 2.8 inches; length of cephalic shield, inclusive of frontal prolongation, 1.0 inch; width of cephalic shield, 1.9 inches; length of glabella and neck furrow, from base of snout, .69 inch; width of glabella across posterior lobes, .69 inch; length of snout from base in front to apex, .75 inch; greatest width of thorax (just posterior to the cephalic shield), 1.56 inches; length of same, 1.8 inches; greatest width of pygidium, .8 inch; length of same .65 inch.

The most striking feature of this trilobite is the very remarkable de-
velopment of the frontal margin of the shield. In all other respects (if we except its larger size) much resemblance is presented to *C. niagaraensis*, Hall. The differences between the two are, however, sufficiently marked, and there can be but little danger of confounding one with the other.

Formation and locality: a rare species occurring in the lower beds of the Niagara Group, at Osgood, Ripley county, Indiana.


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**DESCRIPTIONS OF NEW SPECIES OF CRINOIDS, FROM THE KASKASKIA GROUP OF THE SUBCARBONIFEROUS.**

By A. G. Wetherby,

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The crinoids described in this paper were collected by me, in subcarboniferous rocks of the Kaskaskia Group, in Pulaski county, Kentucky. The genus *Pterotocrinus* was fully discussed in a previous article, and its relationships made out so far as the specimens permit. The unequaled preservation of these fossils has made their specific identification an easy task.

**Pterotocrinus acutus,** n. sp.

[Plate XI., fig. 2a upper, 2b basal, 2c side view, natural size.]

**Basals**—Two, pentagonal, centrally excavated dorsally and laterally for the reception of the slender column. Their line of junction, produced, passes through the center of the latter, of the azygos plate, between the inner edges of the first radials on the azygos side, and through the center of the first radial upon the opposite side. These plates are thickened and slightly carinated at the outer edges of the columnar excavation.

**Radials**—First series five, the two on the azygos side heptagonal, wider than high, laterally excavated inwardly for the reception of the convex sides of the azygos plate, above the apex of which they unite, completely inclosing it.

The opposite, or anterior first radial is heptagonal, wider than high, with a slight central angle on the basal side. It is excavated on the opposite face for the reception of the small second radials, which meet in a line over its center.

The other two first radials are hexagonal, wider than high, and nearly like the last, except that they join the basal by a single side.