this division of equipotential lines into two classes with different characteristics is as follows:

As y goes from 1 to ∞, the potential along the line $x = -L'(0 < L' < \infty)$ no longer varies from 1 to 0 but only from 1 to $\frac{1}{2} + \epsilon$ with $\epsilon > 0$. Similarly, as y goes from -1 to $-\infty$ along the same line, the potential varies from -1 to $-\frac{1}{2} - \epsilon$. Thus the potential at an infinite distance from the conducting lines is not a unique constant but assumes different values in different portions of the infinite domain even though the total charge is zero.

The reason for the discrepancy in the behavior of the equipotential lines calculated from Eq. (10) and that to be expected from physical considerations may lie in the nature of the mapping. As mentioned in the beginning, the z-plane is obtained by mapping—by means of function (6)—the infinite strip of the ζ-plane bounded by $\eta = \pm 1$. The basic solution of the potential problem in the ζ-plane is valid only in the region between the conducting lines and does not hold for $|\eta| > 1$. No consideration is given to values of the potential in the ζ-plane which lie outside the conducting lines though this problem has definite physical meaning.

Since all functions of type (11) accomplish the same result as the Helmholtz function, i. e., map an infinite strip of the ζ-plane on to the whole of the z-plane, it is to be expected that the solution of the potential problem based on any of these transformations would show a similar anomalous behavior. This is indeed the case. For example for any solution of type (24) extending to $n = 2N + 1$, the equipotential lines are divided into two different classes by the limiting value

$$|V| = \frac{1}{2(2N + 1)}. \qquad (29)$$

(The Helmholtz solution corresponds to the special case $N = 0$). However, the limiting value is not a continuous function of N, for as N, i. e. the number of terms in the series, becomes infinite, the limiting value does not decrease to 0 as might be expected from Eq. (29). For example, the limiting value for

$$z = W - \{e^{-k(1+e^{\pi W})} - 1\}/\pi k \qquad (30)$$

obtained from transformation (23) is $|V| = \frac{1}{2}$, as in the case of Eq. (10).

It would seem therefore that a transformation which maps only the strip between the conducting lines in the ζ-plane on to the whole of the z-plane, while at the same time folding over the conducting lines, is not likely to lead to a physically meaningful solution.

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PALEONTOLOGY.—*Two new crinoid species from the Henryhouse of Oklahoma.*

Harrell L. Strimple, Bartlesville, Okla. (Communicated by Alfred R. Loeblich, Jr.)

In 1952 the author described three species of *Lecanocrinus* from the Henryhouse formation (Silurian) and at the time noted (p. 318) that they were the most distinctive forms of the genus found in that formation. A small species, somewhat comparable to *L. pisiformis* (Roemer), was not considered at that time pending closer comparison with the Beech River (Brownsport) species. Several specimens of *L. pisiformis* from the vicinity of Decatur, Tenn., were found in the collections made by the author and his wife, Mrs. Melba Strimple, during the years 1951 and 1952. The Beech River form is very close to the Henryhouse species but lacks the strong papillae and has a different arm development. The name *L. papilloseous*, n. sp., is proposed for the small form found in the Henryhouse formation.

A unique species of *Pisocrinus* from the Henryhouse formation is described below as *P. spatulatus*, n. sp. It is from the same horizon that produces *L. papilloseous.*

Sagenocrinoidea Springer

Sagenocrinitidae Bassler

Lecanocrinus Hall

Lecanocrinus papilloseous, n. sp.

Figs. 1–4, 9, 10

The crown is spherical in outline, with the dorsal cup occupying almost two-thirds of the height of the crown. Greatest width is at about midsection of the basal circlet and is almost equal to the height of the crown.

Dorsal cup is wider than high and is composed of three small IBB, five relatively small BB, five very large RR, a small quadrangular shaped RA, and a narrow, elongated anal X. The IBB circlet is almost entirely covered by the large, round stem scar and is barely visible in side view of the dorsal cup. The smaller IB is right posterior in position.

There are 10 broad, short, asymmetrical arms. Second primibrachials are axillary in all rays. The widest arms and largest secundibrachials are in the left anterior ray. The other rays are of smaller, and approximately equal width at their base but are unequal in their distal portions. The rays of the right posterior is better developed than the right anterior ray, and has the greatest number of secundibrachials of any ray. The upper portions of the left posterior and interior rays are very restricted in size.

The entire crown is ornamented with minute papillae that form no pattern, and on occasion appear to coalesce.

Measurements in mm.—As follows:

	Holotype
Height of dorsal cup	8.0
Height of crown	10.0
Maximum width of crown	8.7

Remarks.—This species is more comparable to *Lecanocrinus pisiformis* (Roemer) than to other described species. *L. pisiformis* is a smaller form yet has more secundibrachials (3–4 SBrBr to a ray), which are symmetrical as they diminish in size. In *L. papilloseous* there are 1 to 3 SBrBr to a ray and they are very irregular in size and shape.

L. invaginatus Strimple, which is also from the Henryhouse formation, is a slightly larger form that is somewhat similar in so far as general cup outline is concerned. The only surface sculpture on *L. invaginatus* is a fine frosted appearance. The arms are much larger, occupy a considerably greater portion of the crown, and have more than one bifurcation, which is quite different from the arm structure of *L. papilloseous.*

Other associated species of *Lecanocrinus* from the Henryhouse Formation are quite distinct from *L. papilloseous* and are not found in the "Pisocrinus" horizon that produces this species.

Occurrence.—Holotype collected by the author in SW/4 NW/4 NW/4 section 33, T.3N., R.6E., figured paratype in NW/4 SW/4 section 4, T.2N., R.6E., Pontotoc County, south of Ada, Okla.; upper Henryhouse formation, Silurian.

Types.—To be deposited in the U. S. National Museum.

Disparata Moore and Laudon

Pisocrinidae Angelin

Pisocrinus de Koninck

Pisocrinus spatulatus, n. sp.

Figs. 5-8

This species is represented in the collections of the author by three dorsal cups all found within a yard of one another, on one field excursion, in a fresh excavation. Subsequent searching has failed to produce any additional specimens referable to the species though other species of *Pisocrinus* are rather common in the exposure.

In general plate structure, the form does not differ appreciably from several species of the genus; there are five asymmetrical BB, the smallest being in the right posterior radius; one large plate in the right posterior, which I prefer to term the radianal rather than inferradianal as proposed by Moore and Laudon (1943, p. 27); and five asymmetrical RR. I am unable to see the need for calling the right posterior radial a superradianal as proposed by Moore and Laudon (1943, p. 27) when the plate is in fact supporting an arm, the same as any other radial plate. A large spatulate shaped extension to the fore of the outer ligament furrow, gives the cup a distinctive appearance when viewed from any direction that is not comparable to any other described species. Small clusters of minute nodes are found on some of the plates in profusion.

The arms, tegmen, and column are not known.

The columnar scar is small, circular in outline and reposes at the base of a small basal invagination.

Measurements in mm.—As follows:

	Holotype
Maximum width of dorsal cup (including the horizontal extensions of RR)	6.9
Height of dorsal cup (to transverse ridge of articulating facets)	2.6

Occurrence.—NW/4 SW/4 section 4, T.2N., R.6E., Pontotoc County, south of Ada, Okla.; upper Henryhouse formation, Silurian.

Types.—To be deposited in the U. S. National Museum.

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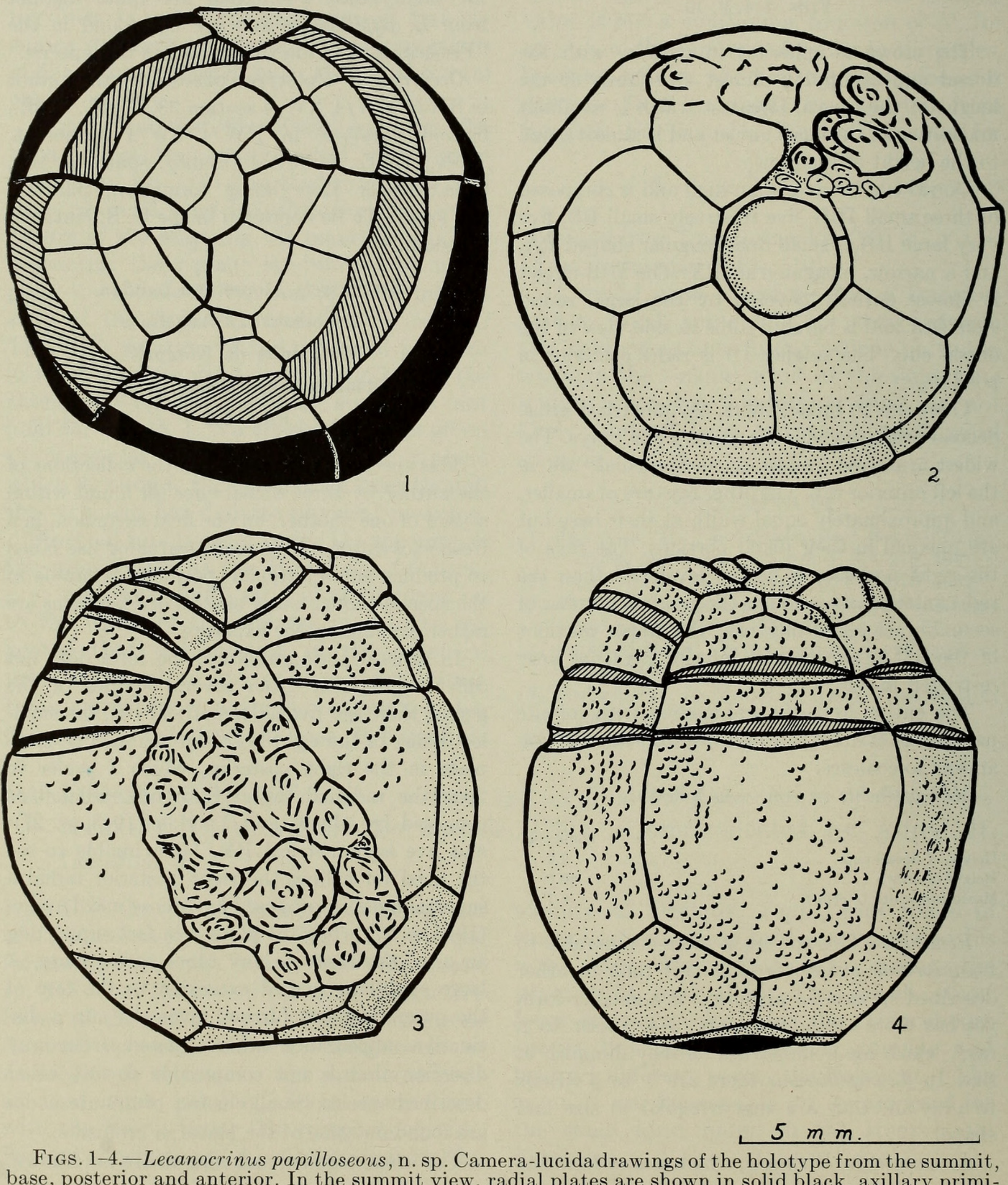
All references are to be found in Bassler and Moodey, 1943. *Bibliographic and faunal index*



FIGS. 1–4.—*Lecanocrinus papilloseous*, n. sp. Camera-lucida drawings of the holotype from the summit, base, posterior and anterior. In the summit view, radial plates are shown in solid black, axillary primibrachials shown by diagonal markings and the posterior interradius (anal X) shown by stippling.

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MOORE, RAYMOND C., and LAUDON, LOWELL R., *Evolution and classification of Paleozoic crinoids*, Geol. Soc. Amer. Special Paper no. 46. 1943.

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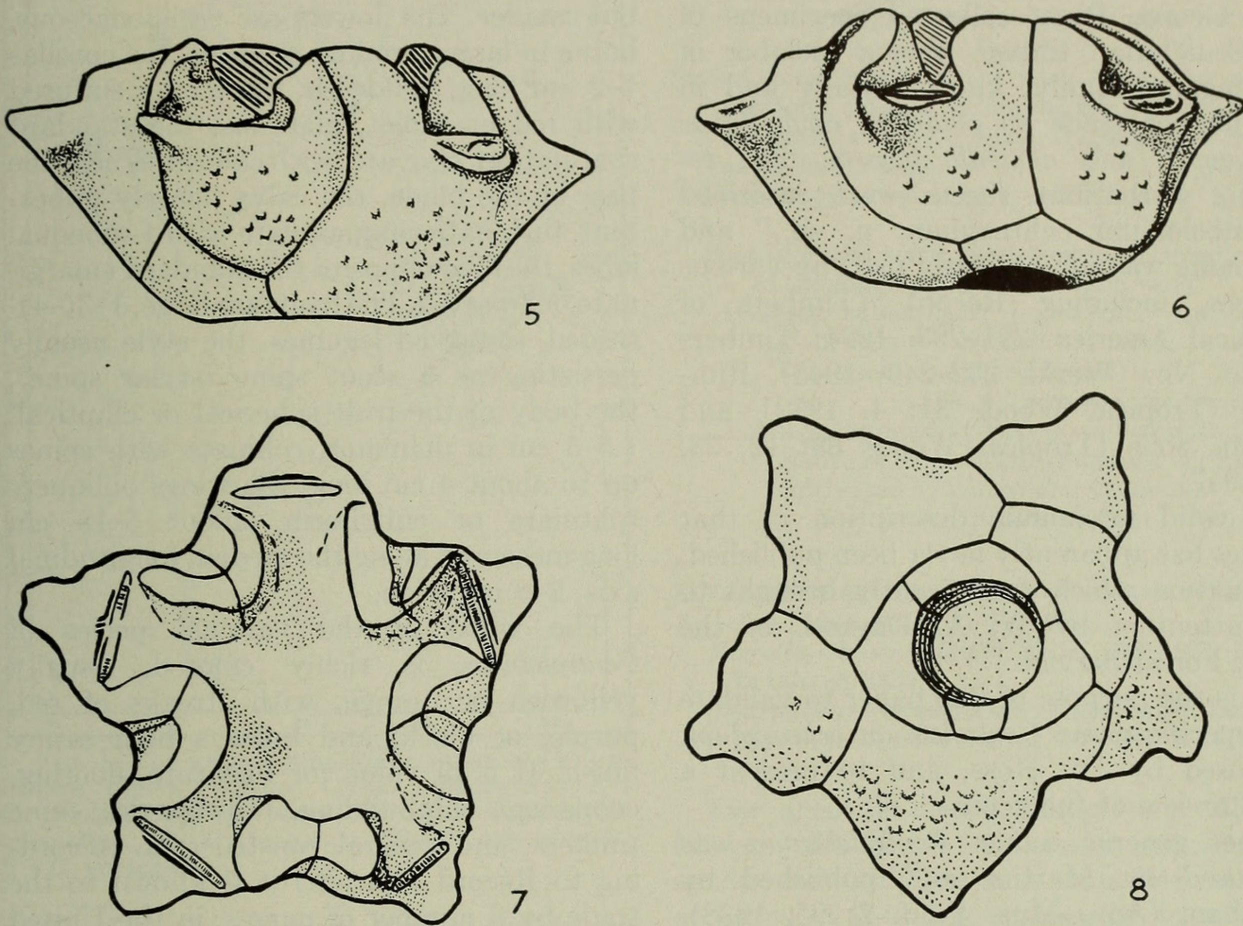

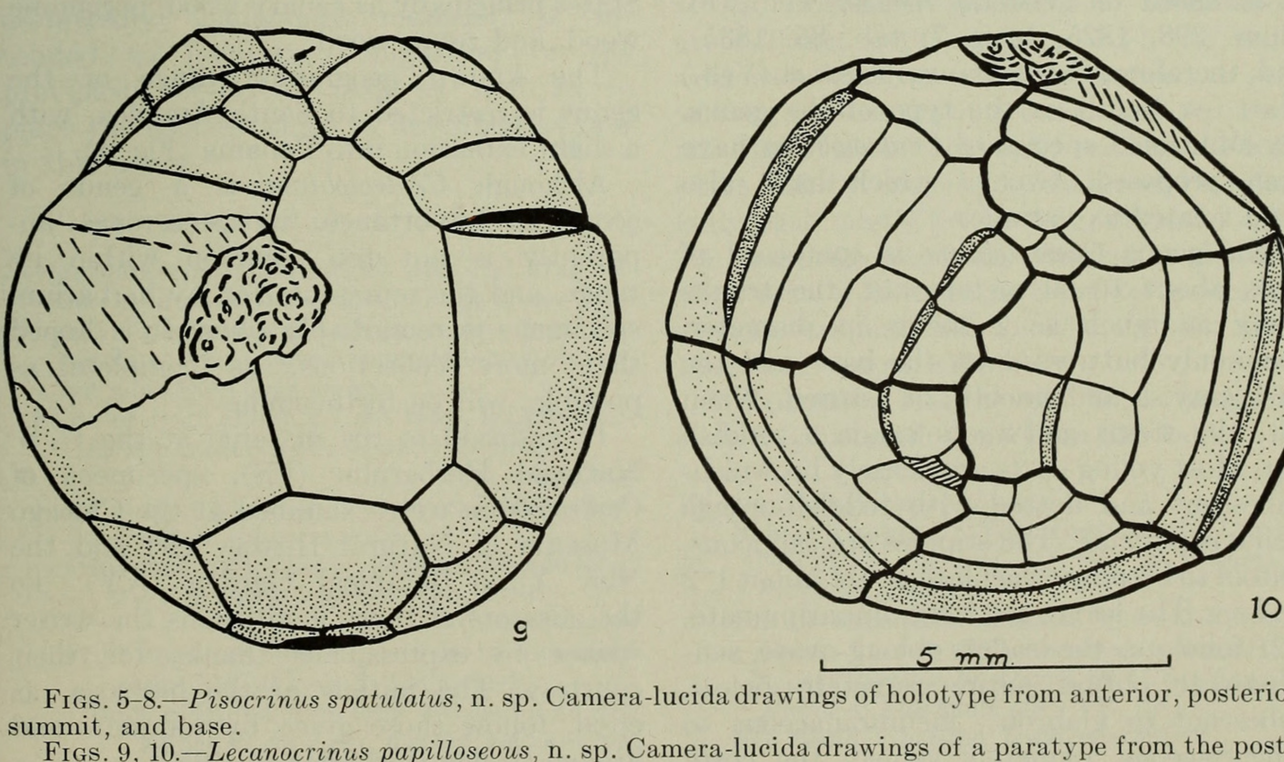

FIGS. 5–8.—*Pisocrinus spatulatus*, n. sp. Camera-lucida drawings of holotype from anterior, posterior, summit, and base.

FIGS. 9, 10.—*Lecanocrinus papilloseous*, n. sp. Camera-lucida drawings of a paratype from the posterior and summit.