

A RARE CRETACEOUS SEA URCHIN, SCUTELLASTER CRETACEUS CRAGIN

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The genus *Scutellaster* was instituted in 1895 by F. W. Cragin¹ for the reception of a specimen "from the arenaceous shale of the Fox Hills division of the Cretaceous, on the east slope of Shook's Run, on Platt avenue, Colorado Springs, Colorado." The type was not figured and the description given indicated that it was rather imperfect. Clarke² in 1915 in his monograph of the Mesozoic Echinodermata of the United States reserved judgment on both genus and species until better material could be found and quoted a statement by Cragin that the latter had come to doubt the validity of the genus *Scutellaster*. No other specimens have been found to date, however, and both the extreme scarcity of echinoids in the Cretaceous of the Interior Province and the unusual character of the species in question warrant further description in spite of the imperfect material. The type was originally a part of the Cragin collection of the museum of geology at Colorado College, Colorado Springs, Colo., but is now in the United States National Museum (Cat. No. 32702). The horizon of the specimen is now believed to be in the top of the Pierre shale rather than the Fox Hills sandstone.

Cragin's original description is as follows:

SCUTELLASTER, new genus

Clypeastrid large, combining the flattish-convex, or discoidal, test of *Scutella* with the pentagonal outline of *Clypeaster*; disc without loophotes or any emarginations other than shallow convexities; ambulacral petals closed, or nearly so.

SCUTELLASTER CRETACEUS, new species

Plate 1, figs. 1 and 2

Test as large as that of a large *Scutella*, or that of one of the more moderate-sized species of *Clypeaster*, obtusely pentagonal, its height apparently about equal to, or not more than, one-tenth of its length; ambulacral petals of

¹ Cragin, F. W., A new Cretaceous genus of Clypeastridae: American Geologist, vol. 15, pp. 90-91, 1895.

² Clark, W. B., and Twitchell, M. W., The Mesozoic and Cenozoic Echinodermata of the United States: U. S. Geol. Survey Mon. 54, p. 67, 1915.

moderate breadth, reaching to within a short distance of the ambitus, the unpaired and anterior paired petals being straight, the posterior paired ones slightly sinuous; breadth of a pore belt (apparently) about half that of a semiambulacrum, the part of the ambulacrum between the pore belts ornamented with light-colored puncta (the supposed spine scars) arranged in quincunx; interambulacral plates thick, separated by deep sutures that are made especially pronounced by the beveled borders of the plates, the adambulacral half (on distal plates, less than half) of each plate being crossed with slightly raised, parallel curved lines, which subtend the borders of the ambulacral petals and between which are puncta that, like those of the ambulacral mid-areas, present the appearance of filled pores and are in quincunx, though forming a simple linear series between each two lines; surface of inner, or contiguous, halves of interambulacral plates plain (or at least without lines, and

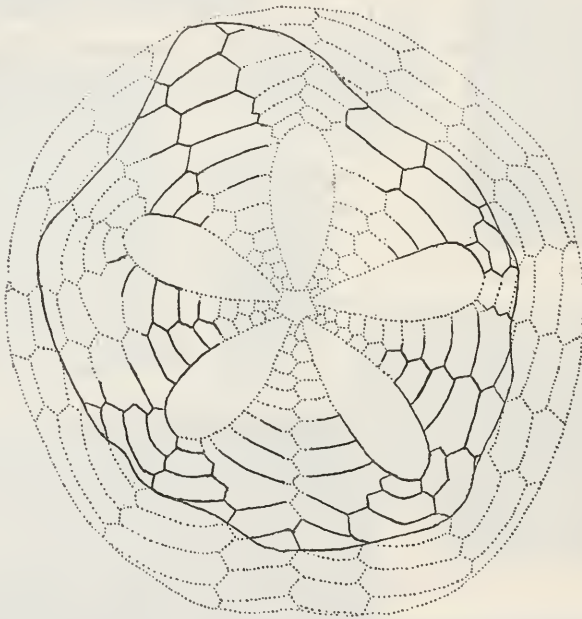


FIG. 1.—HYPOTHETICAL RESTORATION OF SCUTELLASTER CRETACEUS CRAGIN, BASED ON THE TYPE AND A MIOCENE SCUTELLA

with only minute puncta, which, in the type specimen, are mainly obliterated), save near the ends, where a number of coarse puncta are so arranged as to constitute a narrow and indefinitely bounded miliary zone.

Between the anterior and either antero-lateral angle, the outline of the test, as viewed from above, presents two trifling concavities separated by a broader convexity. Between either antero-lateral angle and the posterior angle of the same side, the outline presents a broad and shallow concavity which culminates opposite the anterior part of the posterior row of plates of that interambulacral field. The bottom of the test is not shown in the type, and the posterior border is imperfect, so that the exact form of the latter and the exact position, etc., of the peristome and periproct are unknown.

Measurements.—Length of test, 105; breadth, 83; height (approximately), 8-10 mm.

The writer believes that the genus *Scutellaster* may fairly be regarded as a *synthetic*, or *generalized*, type from which have been evolved *Scutella* on the one hand and *Clypeaster* on the other.

In the present condition of the type, as shown by the retouched photograph forming figure 1 of plate 1, some of the details noted by Cragin are not evident. The ambulacral petals are entirely

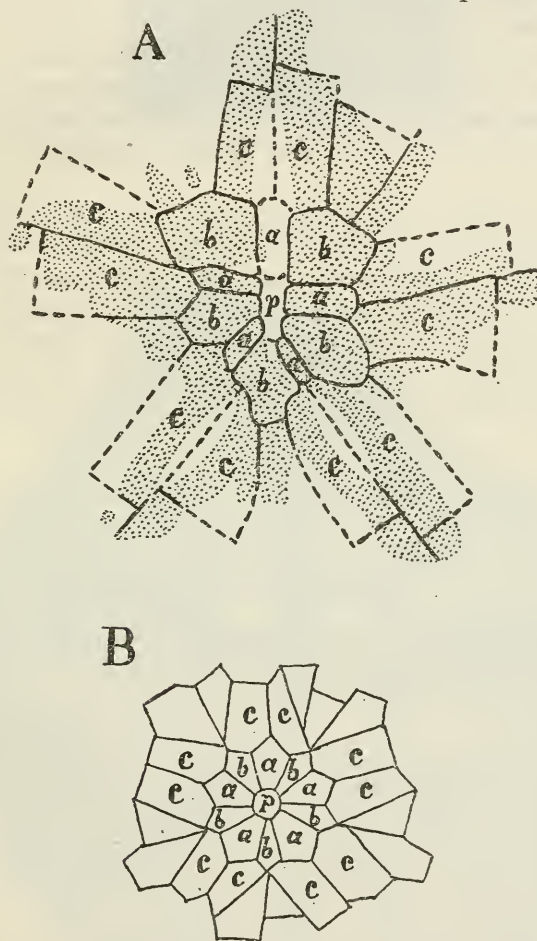


FIG. 2.—COMPARISON OF ARRANGEMENT OF PLATES OF (B) ACTINAL SIDE OF SCUTELLA SUBROTUNDATA LAMARCK WITH THAT OF (A) SCUTELLASTER CRETACEUS CRAGIN. THE LETTERS INDICATE THE EQUIVALENTS AS INTERPRETED BY THE WRITER. PERISTOME=*P*.

missing, and it is possible only to guess at their probable maximum length and breadth. The original surface of most of the plates is gone and in only a few small areas is anything suggesting the spines or tubercles present (see pl. 1, fig. 2). No part of the ambitus is preserved, and any statement as to the outline of a complete test is unfounded. To all appearances the outline of the specimen is as it was when originally found, and Cragin was probably unjusti-

fied in describing it shaped like *Clypeaster*. The test, however, clearly was broad and flat as in *Scutella*, and such of the plates of of the upper (abactinal) surface as can be made out do have a scutelliform arrangement. A hypothetical restoration of the abactinal surface, based on the specimen in hand and a Miocene *Scutella*, is shown in figure 1.

The petaloid areas and the central part of the test have been deeply excavated at some time and now disclose a group of peculiarly shaped plates which, however, may be matched closely with those of the undersurface of *Scutella*. A diagram comparing the arrangement of the plates with that of a Miocene *Scutella* is given in figure 2.

It seems to the writer probable that if better material is ever discovered this genus will be found very close to *Scutella*, if not identical with it. Inasmuch as only the single unsatisfactory specimen is now at hand, it seems best for the time being to leave the generic assignment as it was made by Cragin. The known Scutellidae are all Tertiary, and the present species if interpreted correctly would extend the range of the family into the Upper Cretaceous.

EXPLANATION OF PLATE

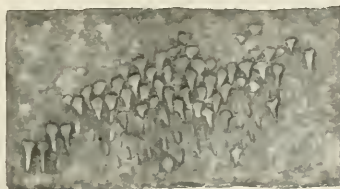
PLATE 1

Scutellaster cretaceus Cragin

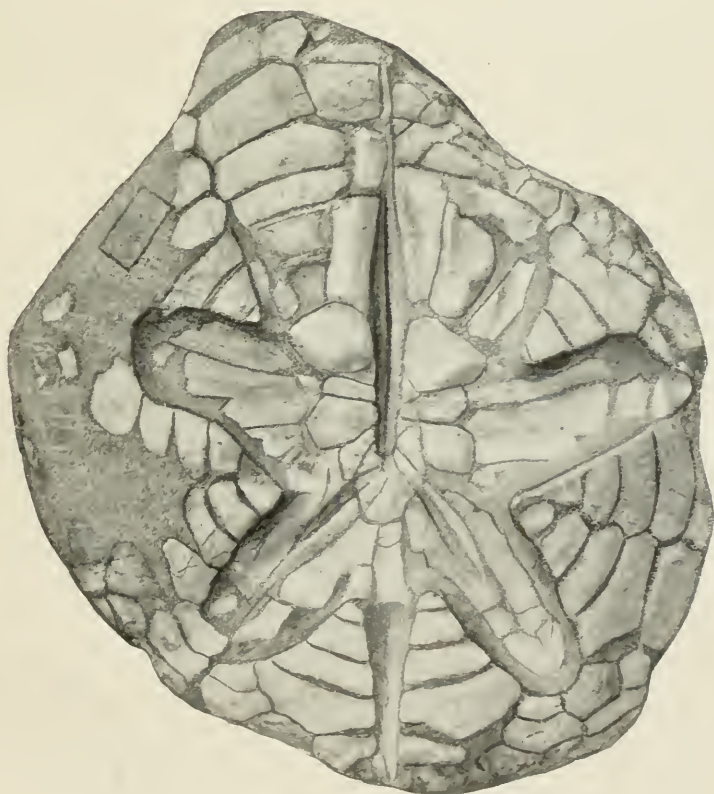
FIG. 1. Type specimen, natural size. Photographs, retouched.

2. Area indicated by small rectangle on figure 1, enlarged 5 diameters. Photograph, retouched.





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SCUTELLASTER CRETACEUS CRAGIN

FOR EXPLANATION OF PLATE SEE PAGE 14