

ART. I.—*Description of a new species of Crinoid from the Burlington lime stone, at Burlington, Iowa.* By R. P. WHITFIELD.

In a collection of fossils and minerals lately purchased by the Am. Mus. of Nat. History, from Mr. H. T. Woodman, there is one slab of Burlington Limestone which contains two magnificent examples of a new species of *Poteriocrinus* that is so much more beautiful than any previously described from that prolific locality, that it has been thought desirable to publish the species with illustrations. The specimens, as they lie imbedded in the rock, show, one of them, the anterior and the other the posterior side of the body, while the arms of one of the larger specimens spread out to a length of nearly eight inches, and occupy a breadth on the stone of about three and a half inches. Both specimens preserve a portion of the column, one of which shows the remains of it to a length of about twelve inches below the base of the calyx, without material diminution in size. The following description will, with the accompanying illustrations, serve to give a fair idea of the species.

POTERIOCRINUS JESUPI. n. sp.

*Plates 1 and 2. Figs. 1.*

Body large, the calyx below the arm bases broadly obconical, with the first radial plates and arm bases somewhat protruding, so as to give an irregular pentalobate character to the upper margin of the cup. Column of moderate size, slightly enlarged just at the base of the calyx, composed of quite thin plates, and perforated by a minute circular or slightly pentapetalous canal. Basal plates a little wider than high on the anal side and proportionally lower on the anterior side. Sub-radials wider than high on the anterior side of the body, while those shown on the anal side are as high or higher than wide; both those adjoining the anal area being heptagonal in form, and the others hexagonal. First radial plates half as wide again as high on the anterior and antero-lateral rays, and as wide again as high on the postero-lateral rays. Second radials about half as high as wide, quadrangular. Third radials

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broadly triangular, the sloping faces supporting the first plates of the arms, except on the anterior ray, where the first bifurcation of the arm takes place on the twelfth plate, those between the first radial and the bifurcating plate gradually decreasing in size upward, and are alternately wider and narrower on their opposite sides. The arms are moderately strong, and round on the back, the surface of the plates smooth and without ornamentation; plates short wedge-shaped, extending entirely across the arm in their lower parts, but often falling a little short at the sides above. The second bifurcation of the anterior ray takes place on the fifteenth plate above the first, on the outer division of each section, and on the eighteenth on the inner division, and of these latter divisions the inner one again divides on the twenty-second plate above the last, and the outer one on the thirty-seventh, on one side of the ray, but varying considerably from this on the other half. This arrangement gives to the anterior ray eight terminal divisions. On the antero-lateral rays, only one of which is perfect enough to count accurately, the first bifurcation above the primary one on the third radial plate takes place on the eleventh plate above, and the second one, on one side, on the sixteenth plate, the inner division again dividing on the twenty-sixth plate above the last bifurcation, above which the arms are simple. The arrangement of the postero-lateral rays differs entirely from that of the others. The first bifurcation is on the third radial plate; the second on the sixth above on the side next to the antero-lateral ray on one of the rays, and on the seventh on all the other divisions. The third bifurcation takes place on the twelfth to the seventeenth plate above the last one, in different divisions of one of the rays, and are even more irregular on the opposite one, one bifurcation being on the twenty-second plate, unless there be a division turned under so as to be unseen. There are three sets of bifurcations on the lateral half of these rays as shown on the most perfect one; above which the arms form eight simple branches; while on the anal half of the ray there are but five branches seen, and not more than six, even if one be hidden. This arrangement gives thirteen (or fourteen?) branches to each of the postero-lateral rays; and forty-eight terminal branches to the entire crinoid.

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The tentaculæ as shown on the specimens are traceable to a length, in places, of nearly three-fourths of an inch, rising alternately from opposite sides of the arms, on the longest side of each plate. The first joint is strong and somewhat bulbous at its base. The others are slender, flattened and grooved, and about twice the length of their diameter.

The first anal plate is irregularly pentangular, and rests upon or between the two adjacent sub-radials, and sustains upon one of its faces one side of the right postero-lateral first radial plate. The second anal is smaller, somewhat regularly hexagonal, and rest on the upper truncated end of the left sub-radial and against one face of the first anal on the right side and the lateral face of the left first radial on the other side. The other anal plates are supported upon these in regular vertical ranges, three plainly visible, of constantly decreasing size, and above the third or fourth in height, their surfaces are regularly marked by elevated ridges, crossing from their centres to the adjoining plates, as is common to most upper anal plates or plates of the proboscis of crinoids of this genus. The entire length of the proboscis has not been ascertained, but from the proportions of the parts visible, it is probably of considerable length.

The species most nearly resembling this one among those previously described from the Burlington limestone is *Poteriocrinus swallowi* M. & W. (Geol. Ills., Vol. II, p. 183, Pl. 16, fig. 4, a, and b). It differs so essentially, however, and in so many particulars that a comparison is scarcely possible. The calyx has the same general character and form, but the arrangement of the anal series of plates is entirely different. The arms are also very similar below the first bifurcation, but above this point are entirely unlike, as those are said to be simple above the second bifurcation which takes place on the ninth plate above the first bifurcation on the third radial, in four of the rays; while on the anterior ray the first bifurcation takes place on the sixteenth radial plate, instead of on the eleventh as in this species.

The specific name is given in honor of Morris K. Jesup, Esq., President of the Am. Mus. of Nat. Hist. through whose liberality the collection of which it forms a part was secured to the Museum.