

LVI. *An Account of an Encrinus, or Starfish, with a jointed Stem, taken on the Coast of Barbadoes, which explains to what kind of Animal those Fossils belong, called Starstones, Asteriæ, and Astropodia, which have been found in many Parts of this Kingdom: In a Letter to Mr. Emanuel Mendes da Costa, F. R. S. By John Ellis, Esq; F. R. S.*

S I R,

Read Dec. 17, 1761. **I** Need not inform you, that the writers on natural history have been much at a loss to discover to what kind of animals those petrified bodies have properly belonged, which are known to us by the name of trochites, entrochi, carpophylloides, encrini, asteriæ, &c. and therefore, it is with the greater pleasure I lay before the Royal Society a recent animal of the rarest of this class.

Mr. Mason of Barbadoes, remarkable for his curious experiments in magnetism, by desire of my friend Dr. Alexander Bruce, of that island, in the month of May 1760, brought me this rare lithophyton, as the doctor called it; but I being in the country, it fell into the hands of my worthy friend Dr. John Fothergil, who was so kind to send it me, to describe, and to oblige the Royal Society with a sight of it.

Dr. Bruce informs me, that they are the inhabitants of those seas, and that he is in hopes of sending me over a more perfect specimen.

Mr.

Mr. Guettard, that able and curious naturalist, has given, in the Memoirs of the Academy of Sciences at Paris, published in 1761, for the year 1755, a most minute description and dissection of an animal of this kind, from the curious cabinet of Madam Bois Jourdain of Paris; it was sent from Martinico by the name of *palma marina*; the head of it, being more perfect than ours, has some resemblance to the branches of a palm tree.

However, as there is some little difference in the figure of both these animals, and as I, about a year ago, had the honour of exhibiting to the Royal Society a curious drawing of it, which Dr. Gartner, of Stuttgart in Wurtemberg, F. R. S. drew for me, I shall give the description that occurred to me, upon the best examination I could take of it, without dissecting, or breaking the specimen.

As it comes nearest to the fossils called *encrini*, or *lilii lapidei*, I shall still keep that name, and call it

*Encrinus, Capite stellato ramoso-dichotomo,  
Stipite pentagono equisetiformi.*

The stem and head of this animal, in its present state, measures about fourteen inches. The stem is about thirteen inches in height, and about the third of an inch in diameter, lessening a little towards the top: it is formed of pentagonous joints, or *vertebræ*, placed regularly over one another, which are of a testaceous substance, and united by very thin cartilages; as appears, by examining minutely the base of the lowest *vertebra*, where it is fastened to the starry indentures of the joint: this makes the *vertebræ* capable

pable of bending at the will of the animal, in any direction.

If we examine the five furrows or channels along the stem, we shall discover a small hole between every vertebra, and in the center of the base of the lowest, we shall find a small hole there, which, probably, communicates through the middle of all the vertebræ to the cavity in the center of the head.

Along this stem, at different distances, from an inch and quarter to a quarter of an inch in length, we observe many series of five cylindrical-jointed arms, each series is of equal length, and placed in a wheel or whirl-shaped form like the equisetum or horsetail plant. Each arm is inserted in one of the five cavities of a vertebra, and each joint into one another; that the upper end of one joint inclines over the lower end of the next to it, which it appears, at the same time, to inclose with a small margin.

These joints are generally about one twelfth of an inch in length, and the same in diameter, except a few near their insertion in the stem, which are shorter and thicker the nearer they are to it.

We may plainly trace a small hole here through the midst of the joints, which communicates through the center of the starry vertebræ in the main stem, to the hooked joint at the extremity of these arms.

On the under or inner side of those joints, that are near the end of the arms, we may discover four minute tubercles in every joint, two at each end; these are of the same testaceous substance with the rest of the joint. By means of this uneven surface, together with the hook, which the last joint forms, bending downwards,

wards, the animal can take a more secure hold of whatever it seizes.

But as the stem of this animal appears evidently to be broke off short at the bottom, we must remain in doubt, whether it moves about in the sea, or is fixed to rocks and shells by a base, like corals, sponges, and keratophytos, until some future discovery shall clear up this matter more to our satisfaction.

In examining the main stem, or column, we may observe some single joints or vertebræ projecting a little farther than the rest. There are generally three or four of these in each division, between the whirls of arms; the angular parts of these joints end in small round knobs; but the knobs at the corners of the vertebræ, immediately under the head of the animal, are remarkably larger than the rest.

The joints or vertebræ of the stem vary in thickness, as well as in diameter; the common thickness is about one tenth of an inch; but in the last four divisions approaching towards the head, they gradually diminish, till they become extremely thin.

We now come to what is called the head, perhaps the body of the animal; for in the center of this dry specimen, there still remains a cup of a crustaceous substance, and of an oval form, about an inch in length, three quarters of an inch over, and a quarter of an inch deep; in the center of this, as was observed before, is a small hole, which apparently communicates with the internal part of the vertebræ of the stem: in this cup, or cavity, it is probable, were the intestines and stomach of the animal, as in the asterias, called *caput Medusæ*. This cup is supported by the  
bases

bases of six dichotomous testaceous arms, or branches, (perhaps five is the natural number, for one seems irregularly placed.) These lower parts, or bases of the branching arms, consist of three joints each, and surround the cup, to which they seem united : each of these divide into two other jointed branches, that are round or convex on their under side, but flattish on the upper, with a deep groove running along the middle, which is furnished with two rows of suckers, as in the *sepia* and *asteria*. From the upper edges of each alternate joint of these branches, arise two rows of small jointed claws, like fingers; these two opposite rows bend in towards each other : each small branch, or finger, is about half an inch long, and one twentieth of an inch broad ; the size of these joints diminish a little, till you come to the last joint, which ends in a point. Each of these joints is pointed at top, and being concave, embraces the lower convex part of the next above it ; these are likewise furnished on their concave side with two rows of suckers, clasping together ; they secure their prey with these opposite claws, or fingers.

As the finer and more subdivided branches were broken off, when I received this specimen, I shall, in order to give some idea of them, lay before the Society drawings from two curious fossils, belonging to the excellent cabinet of Mr. Francomb. One of them (B) shews all the ramified arms of the head closed up together, and the other (C) plainly shews the small internal claws, or fingers, proceeding from these arms. These were found at Pyrton-passage in Gloucestershire. The fossils themselves, with that of

the encrinus sent me from Barbadoes (A), [*Vide Tab. XIII.*] I have now the honour of laying before the Royal Society

I am,

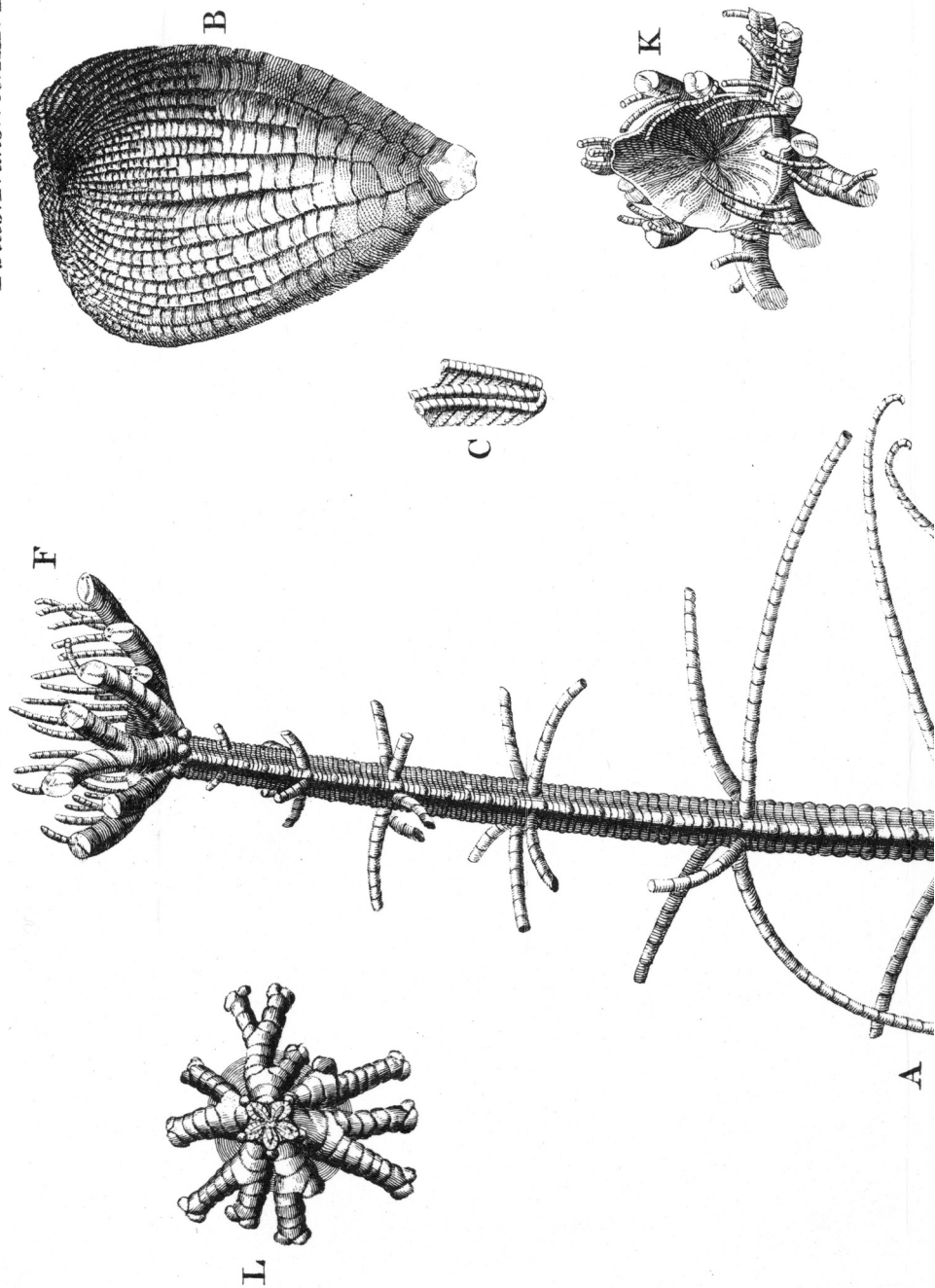
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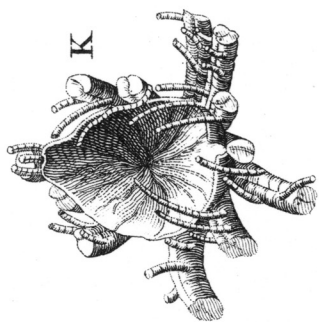
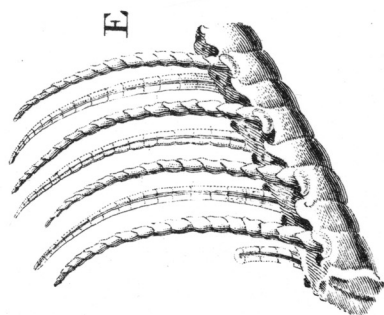
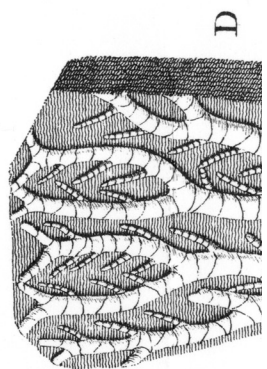
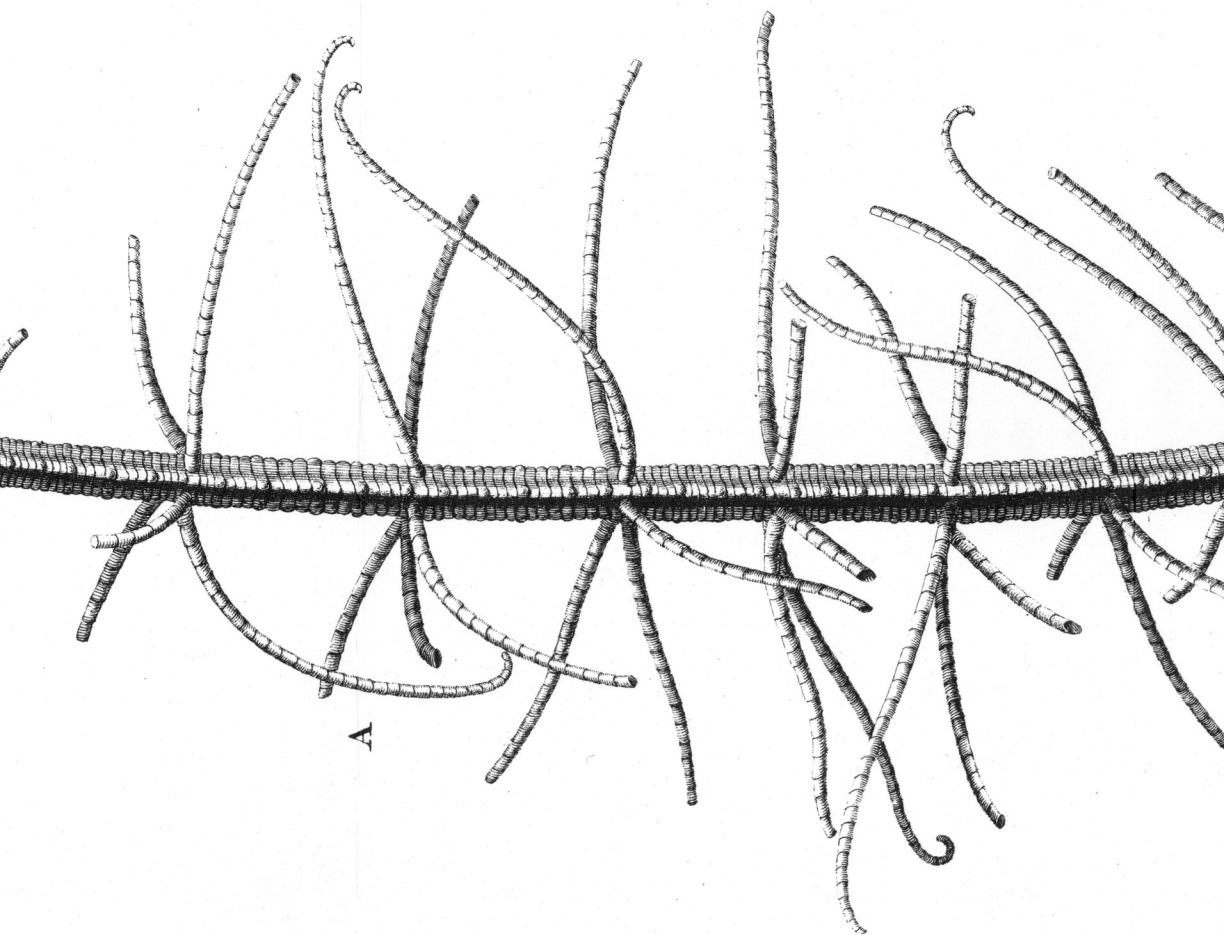
Your most obedient servant,

Park-Street, Westminster,  
Dec. 17, 1761.

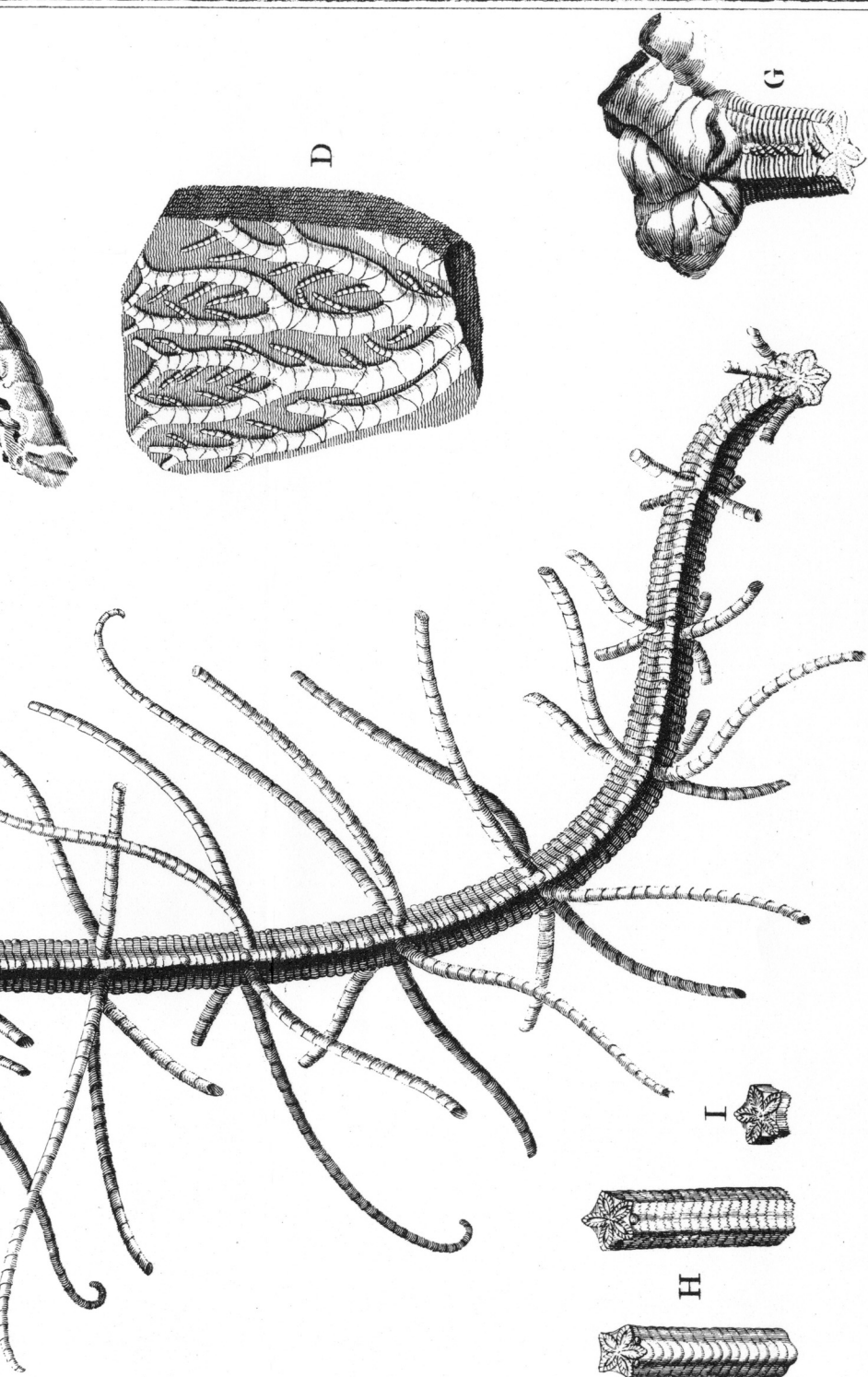
John Ellis.

P. S. In order to give a clearer idea of this curious animal, I have added another plate, [*Vide Tab. XIV.*] taken from the French engraving of their encrinus; and, to illustrate the plates, I have given a particular description of both of them, with proper references.



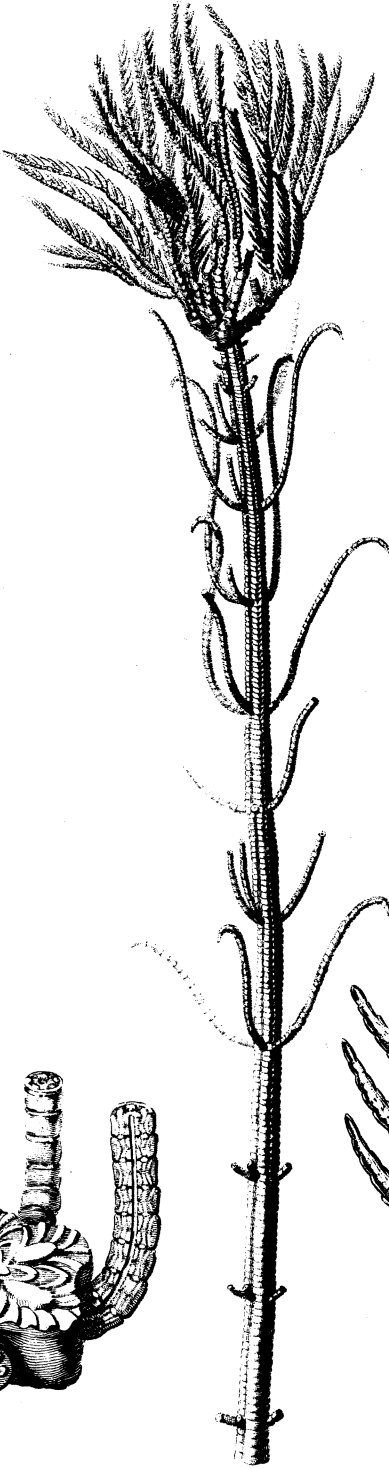








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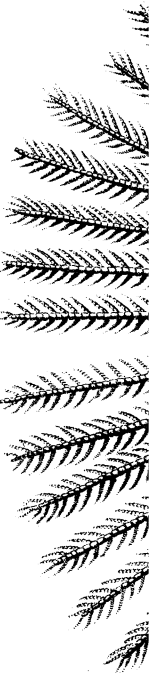
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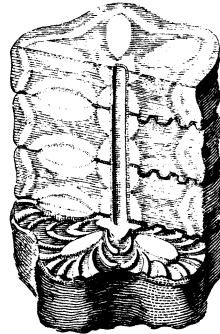
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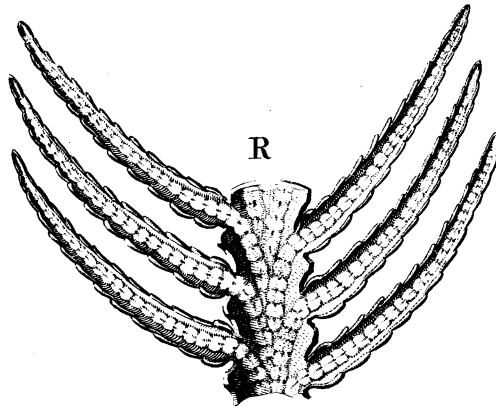
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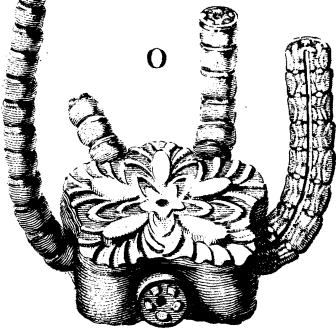
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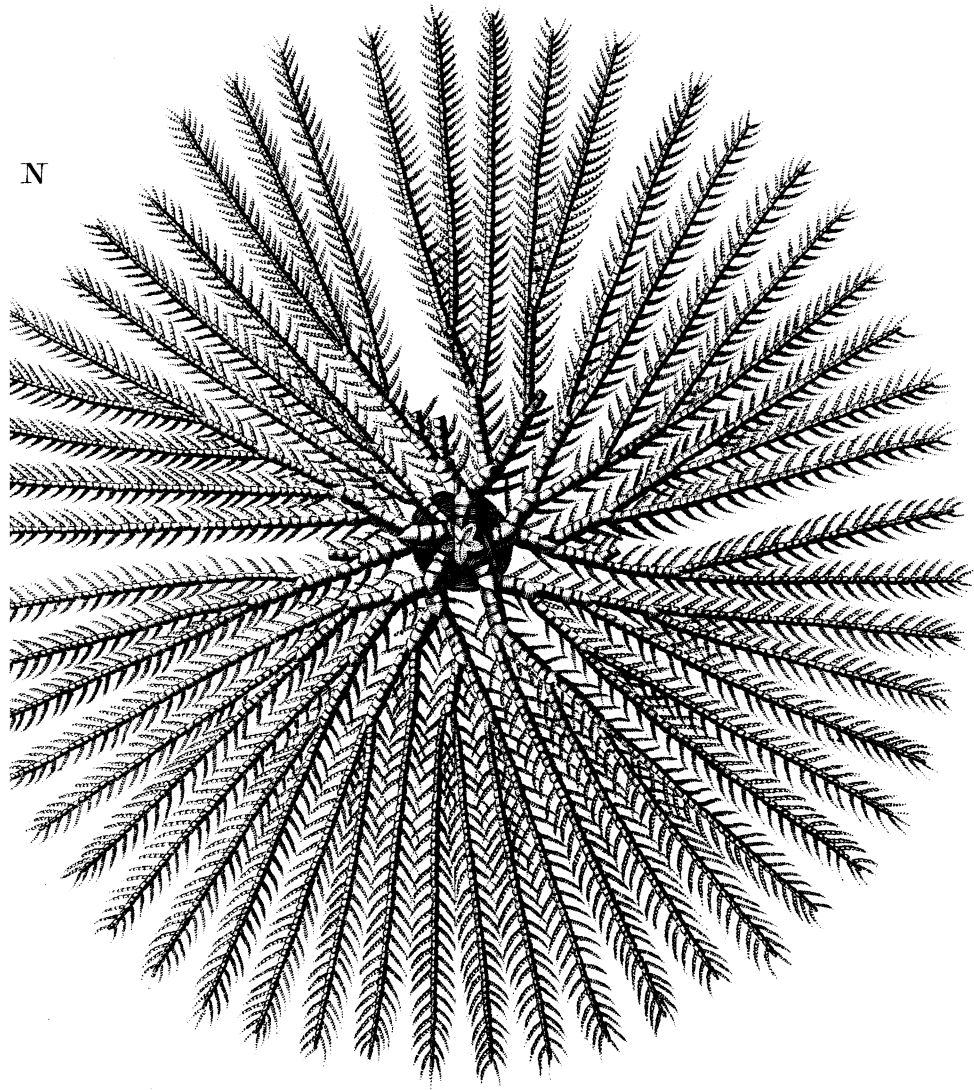


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The Description of the P L A T E S.

Plate N° XIII. represents, at

- A The exact size of the Barbadoes encrinus, or the branched headed starfish, with a pentagonous jointed stem, having many ranges of cylindrical jointed claws, disposed, at particular distances round the stem, in form of rays.
- B A curious fossil found at Pyrton-passage in Gloucestershire, being evidently the head of an encrinus, or starfish, of the same kind, with all its subdivided branches drawn in close together.
- C This fossil, which was found at the same place with the former, exhibits part of a branch belonging to the head of the same animal, wherein the inward fine jointed fibres, or fingers, exactly agree with the recent specimen.
- D A fossil copied from Rosinus, representing the subdivision of the branches of the head, with the jointed fibres, or fingers, as in the foregoing.
- E A piece of a branch of the head of the Barbadoes encrinus, at F, magnified, to shew the disposition of the joints of the fibres, or fingers.
- F The mutilated branches of the head of the Barbadoes animal.
- G A fossil asteria, found in Marston-truffel in Northamptonshire, and copied from Morton's history of that county, Tab. X. Fig. 19. This plainly appears to be the top of a columnar stem, with part of the branches of the head of one of these animals.

- H Two pieces of the common fossil afteria, one with its joints united by sutures, the other plain. This fossil is well described by Dr. Lister, in the Philosoph. Transf. N<sup>o</sup> 112. p. 274. Tab. II.
- I Represents one single joint of the fossil afteria.
- K The cavity at the top of the head, or rather the cavity in the center of the branched arms of the Barbadoes encrinus, where we may reasonably suppose the stomach and intestines were contained.
- L The under part of the head, to shew the insertion of the arms.

Plate N<sup>o</sup> XIV. represents, at

- M The Martinico encrinus, or branched headed starfish, with a jointed stem, sent to Madam Bois Jourdain, of Paris, by the name of palma marina. This figure is much less than the original, which is eighteen inches long.
- N The under part of the head, with the arms divided in a dichotomous or twofold manner, and disposed like branched rays, each of which is furnished with ranges of small fingers, or jointed fibres, placed on each side in an alternately pinnated order.
- O One of the joints of the main stem magnified. In this figure, the five jointed cylindrical claws, which are inserted in the hollow parts of the vertebra, or joint, are exhibited in different views, as well to discover their inward as their outward form and texture. On the upper surface of this joint, are most elegantly expressed those curious indentations, which connect the vertebræ together, containing

taining a cartilaginous substance, that gives strength and pliancy to the animal, to move the main stem in any direction.

**P** The outside of a part of one of the small arms of the head, with two of the jointed fibres, or fingers, closed together.

**Q** The inside of the same figure.

**R** This figure expresses the same part of the animal, but with six fingers placed alternately opposite; all which, as well as part of the arm, in which they are inserted, are represented expanded, to shew the form and disposition of the suckers, which are of the same kind in this animal, as in the *sepiæ* and *asteriæ*, or what we call the cuttlefish and starfish.

**S** This represents four vertebræ of the stem, three of which are cut perpendicularly through the middle, to shew part of the small tube, which passes through the center of all the joints, and to give a view of the uniting of the indentations.

