

this animal was embedded, that I despair of finding any whole bones: But I think these fragments are sufficient to shew, that the elephant was as large as that mention'd by Fentzelius, in these *Transactions*.

The apex of the tusk, which I preserv'd, and the acetabulum before you, were both found within twenty feet of the other bones mention'd, and are, as I apprehend, in better condition than they are, from their being taken up immediately upon being discover'd, and not left to be expos'd to the injury of the weather, and violence of the tides; which soon affects bodies so expos'd, after having lain under ground for ages.

LXXXIV. *A Letter from Mr. John Ellis, F. R. S. to Mr. Peter Collinson, F. R. S. concerning the animal Life of those Coral-lines, that look like minute Trees, and grow upon Oysters and Fucus's all round the Sea-coast of this Kingdom.*

S I R,

Read June 13, 1754. **T**HE doubts, that I find still remain on the minds of many curious and learned men of the animal nature of corallines, on account of their beautiful ramifications, and regular plant-like appearances, determin'd me to persuade our ingenious friend, Mr. Ehret, to accompany me to the sea-side, that he might there be an eye-witness of what I had advanced to you, and many other

4 K 2

worthy

worthy members of the Society; and to make exact drawings of the several different objects, as they appear'd to him thro' the microscope.

Accordingly, on Monday the third of this instant June, we set out, and arriv'd at Lewes in Suffex that evening, and the next morning at Brighthelmstone. The weather being very calm, and few fucus's or corallines being thrown ashore on the beach, I hir'd a fisherman, the next day, to take up some oysters from an old oyster-ground, that had been long disus'd, lying about three or four leagues off to sea, and where, by his description, the shells were cover'd with great varieties of these minute tree-like corallines; with directions, that, as soon as he took them out of the sea, he should immediately put them into a bucket of sea-water; but, unfortunately, he put the oysters into a fisherman's basket; by which means, many varieties were dead, notwithstanding we receiv'd them two hours after they were taken out of the sea, and had them put immediately into sea-water: However, by the oysters lying on one another, some of the corallines were kept so moist, as to be perfectly alive, and brisk. In order to distinguish them more easily, we pluck'd them off the oysters, and placed them in white earthen plates, and pour'd as much sea-water over them as would just cover them: After we had let them rest for a little while, to recover themselves, we could easily discover, with a magnifying glass of an inch focus, which were alive, and which not: Accordingly, I cut off small pieces of several of the liveliest, and placed them in watch-glasses fill'd with sea-water; these, after resting a little while, I placed, one after another, on the stage of the microscope.

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The unusual sight so amaz'd our friend (who had his doubts), that he could scarce believe his own eyes; for he had hitherto imagin'd, with many others, that these corallines were vegetables, and only the receptacles of animals, as many other plants are, and not the proper cases, skins, or coverings, of their bodies.

The first coralline that offer'd itself to our view, was *n° 1.* (*Plate XXII.*), where it is represented, in its natural appearance, climbing upon the podded fucus *a*, with irregular threadlike ramifications, as at *b*; one of which is exhibited magnified at *A*, in which we may observe a broad dark line in the middle of the transparent stem and branches. This is part of the tender body of the animal, and seems as a support for its several heads and stomachs, with the many hands or claws belonging to each: For at the top of each of the branches we may observe a polype with twenty tentaculi, or claws, which do the office of hands, its mouth in the centre of them, and its stomach underneath, inclos'd in a fine transparent cup. The fine out-lines represent the horny skin, or outward coat, that serves this compound animal as a defence, in the same manner as the shells of testaceous or crustaceous sea-fish.

The skin or covering of the arms, that support the cups, is form'd in small rings, which gives the animals the more freedom to move about dextrously in seizing their prey.

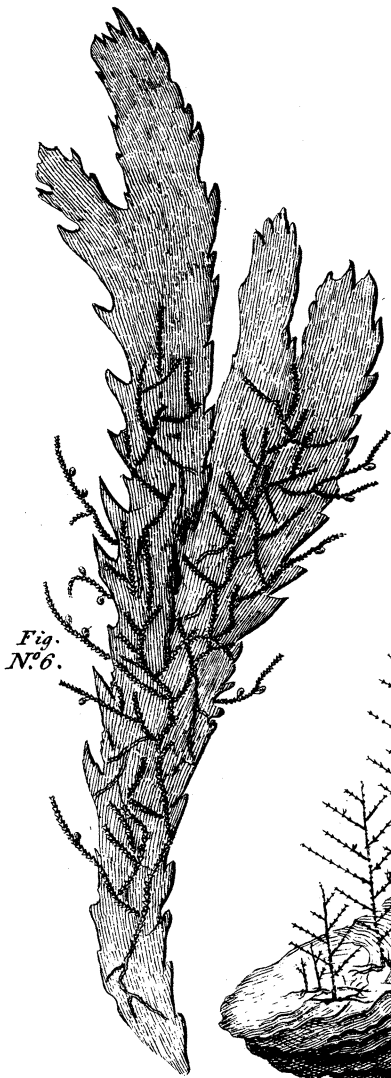
At letter *B* is the microscopical representation of a still smaller coralline than the former; the natural size of it is express'd at *fig. 2.* This creeps up, and twines round other corallines by small vermicular tubes, and sends out its curious slender arms irregularly:

larly: These arms, in the microscope, look like rows of the smallest beads of a necklace: To the top of each of these is fix'd a cup, for the reception of the polypes, the brim of which is curiously indented. These we saw alive, and extending themselves about in various directions.

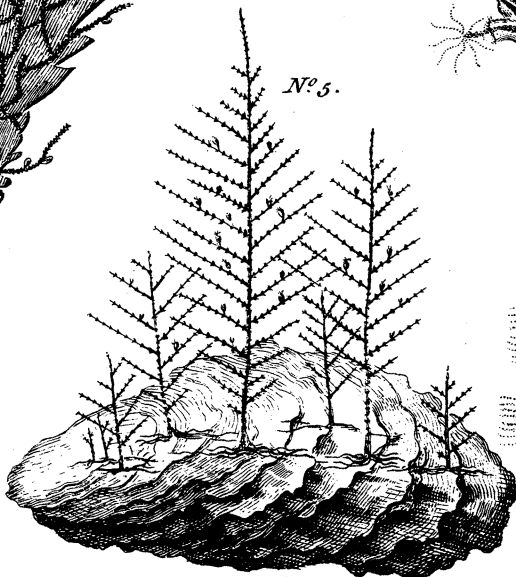
Fig. n° 3. represents part of another coralline of its natural size, just as it appear'd expanded in a plate of sea-water.

It is call'd, in Ray's *Synopsis*, ed. 3. *corallina ramosa cirris obsita*; and by Doody, in Ray's *Synopsis*, ed. 2. *fruticulus elegans geniculatus cirris obsitus*. Letter *C* expresses a branch of this coralline magnified; where you may observe, on each capillary side-branch, rows of small polypes, each with eight tentaculi, or claws, rising out of little sockets. The upper division, or tube, of these little branches, as at *b*, appears full of joints, one to each polype; but we could easily perceive, that all the polypes were connected together, and communicate with the principal stem, or body, which is inclos'd in the middle tube. The under small tube of the capillary side-branch at *c*, which runs parallel with the upper one *b*, and adheres to it, appear'd clear, hollow, and jointed.

This coralline arises from a tuft of small irregularly-matted tubes, like a sponge growing to an oyster-shell, as at *g*; the smaller branches *e* are inserted in circles round the larger branch *f*, at equal distances, like the plant call'd horsetail, or *equisetum*. As we were observing these corallines, we perceiv'd, on one of them, a different-shap'd polype, which thrust itself out of a small funnel-shap'd pipe: This was inserted



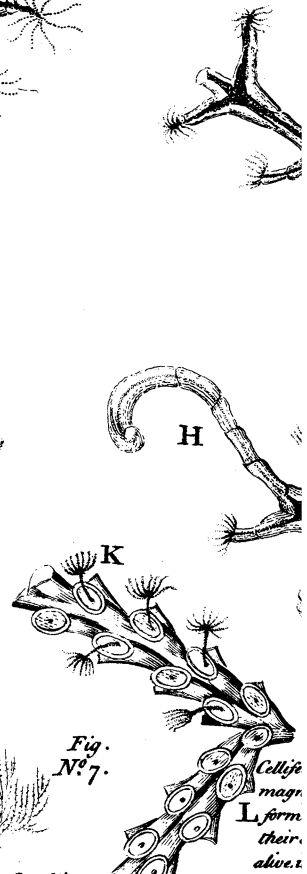
*Sea Oak Coralline.
creeping on a piece
of a Fucus so call'd.*



*Pomgranate flowering Coralline
On an Oyster shell.*



*Sea Oak Coralline magnified
to shew the animals in the stem
and vesicles.*

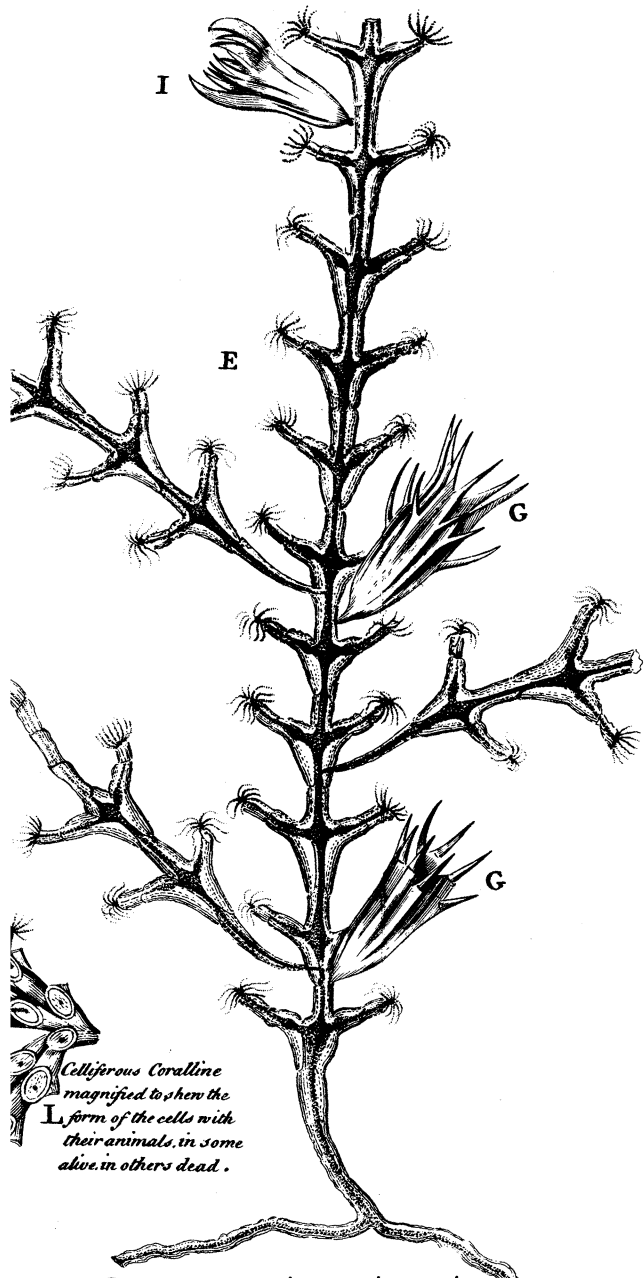


*Fig.
N°7.*

*Celliferous Coralline
with angular edges to its cells.*

*Cells magnified
L form their
above.*

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Cellular Coralline
 magnified to shew the
 L form of the cells with
 their animals, in some
 alive, in others dead.

Pomgranate flowering Coralline magnified
 to shew the appearance of the animals in the stem
 and the different form of the vesicles. J. Mynde sc.

serted in a cell, whose brim, or border, was surrounded by little spines.

These cells we observ'd to compose that spongy rough matter, which incrusts almost all marine substances, but chiefly fucus's. *Fig. 4.* represents the natural size of these cells on a fucus; letter *D* expresses the cells and polypes, with twelve tentaculi to each, as they appear magnified; where the animals are seen raising and expanding themselves. When they are disturb'd, they draw themselves within their sheath, or pipe, which closes on them, and sink together into their cells.

The curious denticulated coralline at *n° 5. Plate XXIII.* has very much the appearance of a plant, at first view, even when it is magnified, as at *E.* This gave us a farther corroborating proof, that these extraordinary species of beings are animals: For we observ'd, that the smaller polypes, that extend themselves out at the opening of every opposite denticle, or little projecting tube, are united at the bottom, or lower-part, to the fleshy substance of the main body, that passes thro' the middle of each branch, or stem, and are so many different bodies united in one; acting like so many sets of hands, placed in form of a circle, collecting food, each for a mouth in the centre, to convey nourishment to so many stomachs, which are fix'd in the swelling part, or bottom, of each denticle. This great supply of nourishment from all sides, gives that great increase, and variety of ramifications, to this wonderful class of many-bodied animals.

Besides these small polypes, which compose the branches, these corallines send forth, from several

parts, many vesicles, of different shapes, at certain seasons of the year, according to their different species.

These vesicles are protruded from the outward skin or horny covering of these branched polypes, and from the inward or fleshy part arises a larger polype; one of which occupies each of these vesicles.

Thus a coralline full of vesicles looks like a plant full of blossoms, which, after they have arriv'd at their perfect state, fall off, with their capsules or vesicles, and become new-detach'd animals, to provide for themselves; in the same manner as the falling seeds produce other plants.

Upon examining this coralline, we found, that the animals in the vesicles were dead; but, immediately afterwards, we had an opportunity of discovering the vesicular polypes alive, in another coralline; which are describ'd at *fig. 6.* in their natural size, and at letter *F* as they appear'd magnified. This species I have call'd the sea-oak coralline, from its being most frequently found creeping on, and adhering to, the largest species of the *quercus marinus*, or sea-oak fucus.

The vesicles of the denticulated coralline, letter *E*, are describ'd as they appear'd full of spines at the top, and clos'd up, as at letter *G*.

The vesicles of the same species are more frequently found as describ'd at *I*, where the spines are not unfolded: From this appearance, I have call'd it the pomegranate-flowering coralline, because they nearly resemble the opening blossom of the balauftine, or double flower of the pomegranate.

The branches of this coralline are often observ'd to end in vermicular tubuli, as at *H*, which are much
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of the same form with those it begins with ; so that these animals can, and do, change their shapes, for the several ends and purposes of their being; and this in a most surprising manner.

I had farther an opportunity of examining some of those kind of corallines, which I call celleferous, from their having rows of cells dispos'd in plant-like ramifications. The small black spots in each cell, which I had conjectur'd before to be the embrio of a future testaceous animal. Vid. *Phil. Transf.* Vol. 48. *Tab.* VI. p. 115. I found now to be the contracted bodies of dead polypes ; for we here saw some of these polypes alive, and extending themselves out of their cells, as at *K*, *fig.* 7. and upon reviewing them, when they were dead, found they made the appearance of blackish spots in each cell, as at *L*, *fig.* 7. So that we have reason to suppose, that this species of polypes, that form these corallines, do change into testaceous bodies. But of this I do not doubt, that time, and more observations, will fully convince the curious. I am,

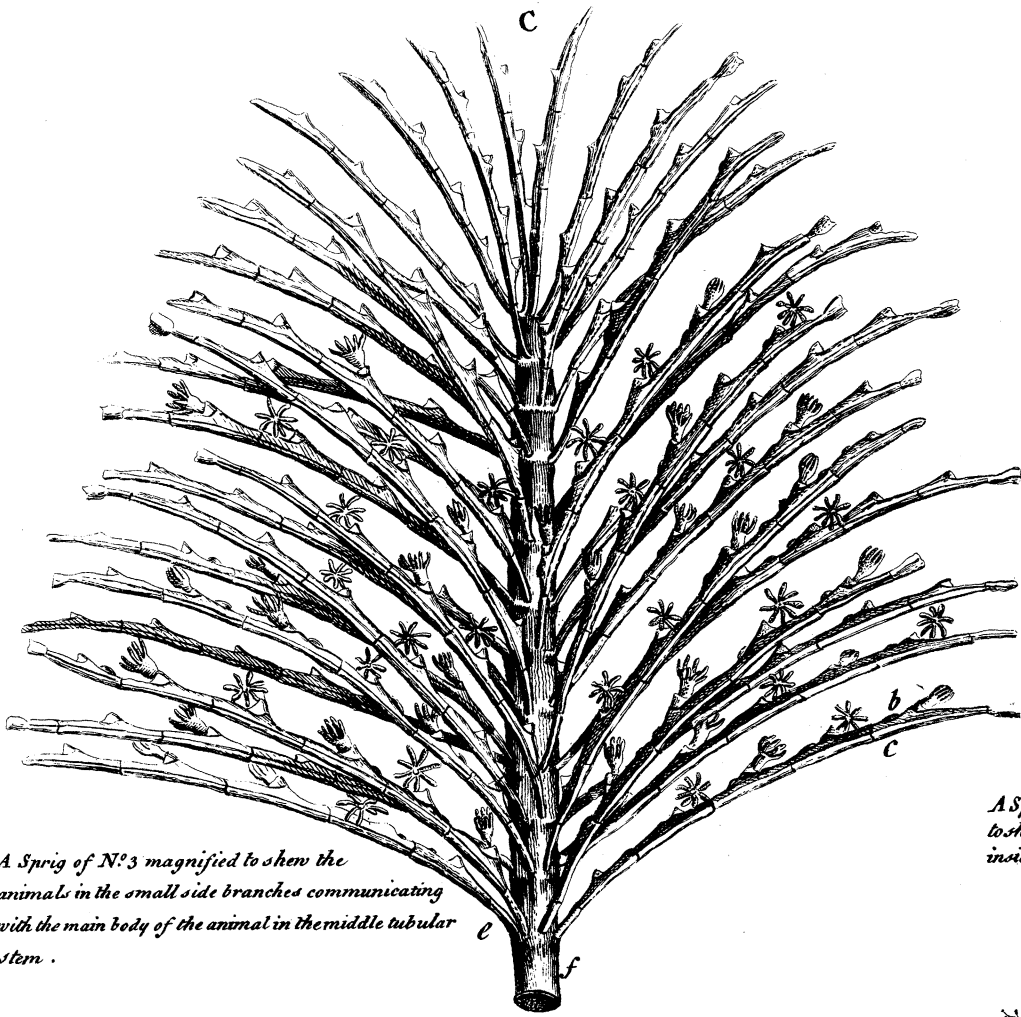
S I R,

Your most affectionate friend, and servant,

Lawrence-Lane,
June 13, 1754.

John Ellis.

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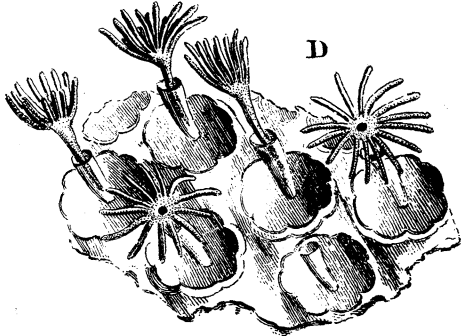
A Sprig of N^o 3 magnified to shew the animals in the small side branches communicating with the main body of the animal in the middle tubular stem.



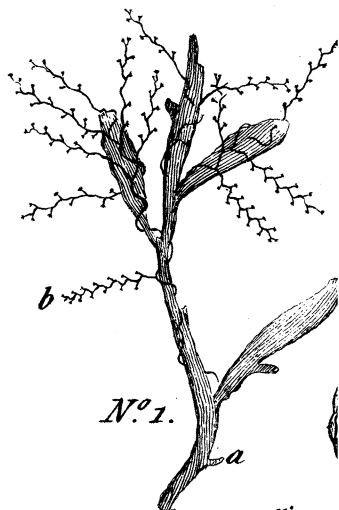
A Sprig of N^o 1 magnified to shew the animal in the inside of its horny skin.



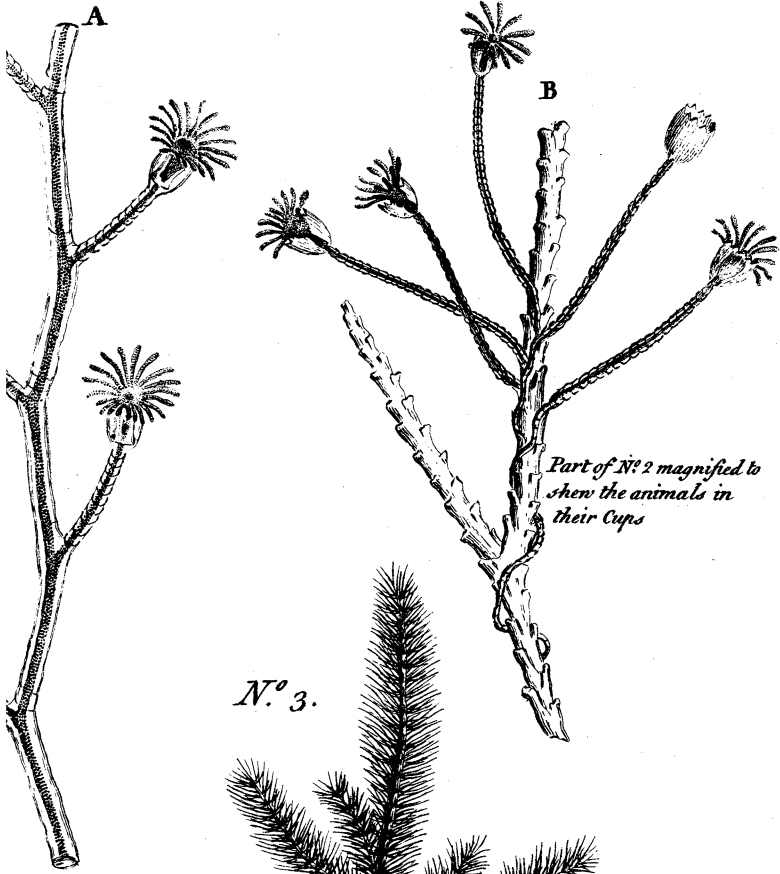
Cells of the common Sea Insect on a Fucus.



A few of the cells at N. 4 magnified to shew the figure of the animals in them



Knotted Sea thread Coralline climbing up a Fucus.





Sea Oak Coralline, creeping on a piece of a Fucus so called.



Pomegranate flowering Coralline On an Oyster shell.

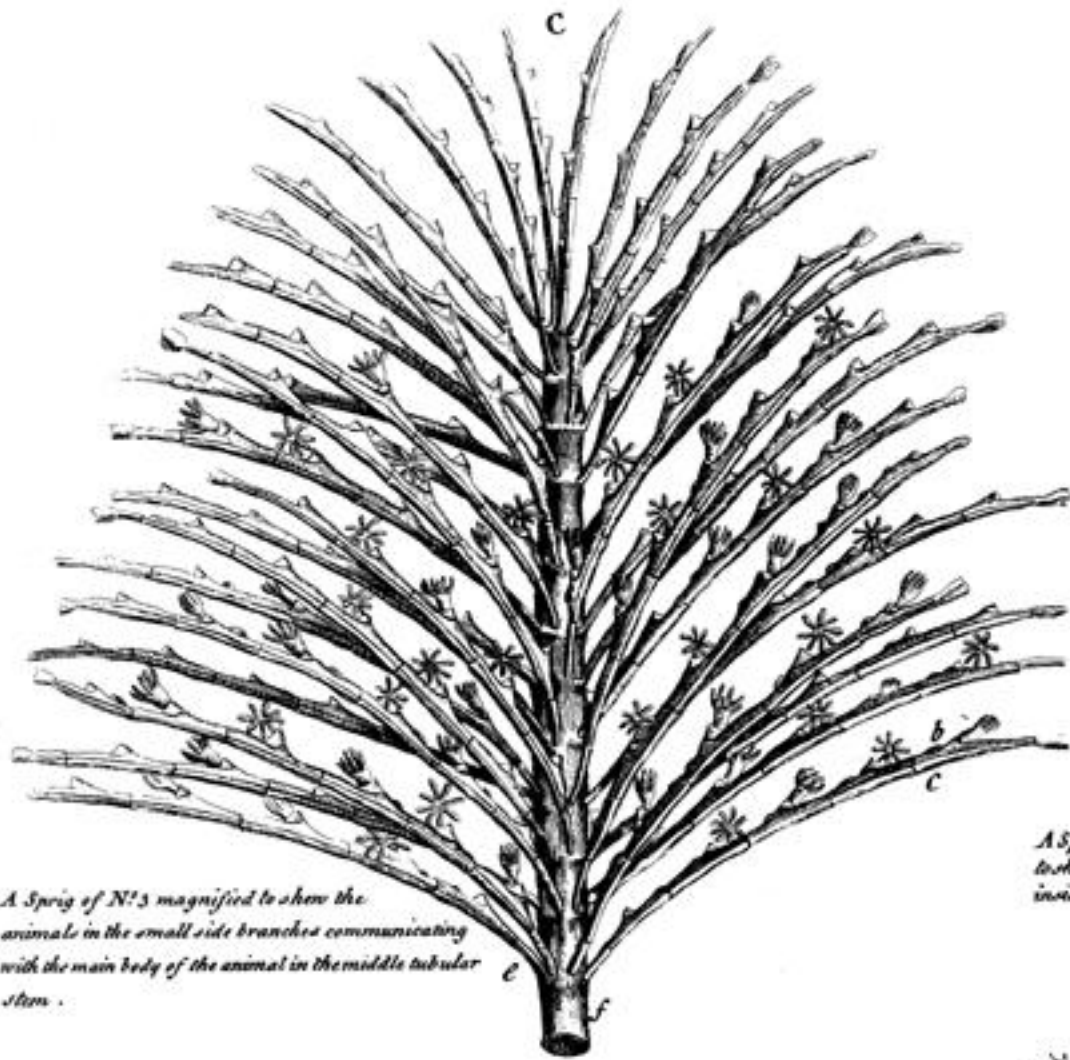


Sea Oak Coralline magnified to show the animals in the stem and vesicles.



Pomegranate flowering Coralline magnified to show the appearance of the animals in the stem and the different form of the vesicles.

J. Mynde sc.



A Sprig of N^o 3 magnified to show the animals in the small side branches communicating with the main body of the animal in the middle tubular stem.

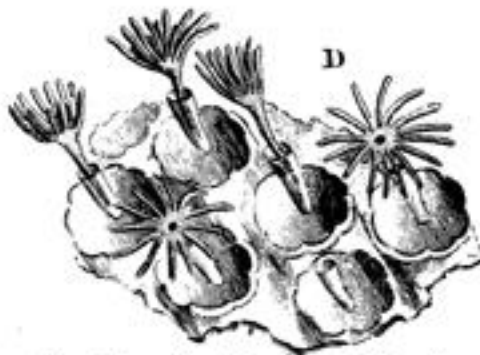


A Sprig of N^o 1 magnified to show the animal in the inside of its horny skin.

N^o 3.



Cells of the common Sea Insect on a Fucus.



A few of the cells at N. 4 magnified to show the figure of the animals in them.



Knotted Sea thread Coralline climbing up a Fucus.



Branchid Lobsters horn Coralline on an Oyster shell. J. Mynde. fo