

From the former of which equations, by taking the fluxions on both sides, will be had $pbx^{p-1}y^q\dot{x} + qbx^py^{q-1}\dot{y} (=v) = mx^ny^{m-1}\dot{x} + qbx^py^{q-1}\dot{y}$. Whence $pbx^{p-1}y^q = mx^ny^{m-1}$; and therefore $pby^{q-m+1} = mx^{n-p+1}$. And in the same manner proper equations, to express the relation of x and y , may be derived, in any other case, and under any number of limitations.

LXXXVI. *Observations on the Alga Marina latifolia ; The Sea Alga with broad Leaves.*
By John Andrew Peyssonel, M.D. F.R.S.
Translated from the French.

Read April 13. 1758. **H**AVING cast anchor at Verdun, the road at the entrance of the river of Bourdeaux, I was fishing with a kind of drag-net upon a bank of sand, which was very fine and muddy. We collected a number of sea-plants, and among them the great broad-leaved Alga, which I did not know : and as the root or pedicle of this plant appeared to be very particular, I observed it with attention. The following is its description, and the detail of my observations.

From a pedicle, which is sometimes flat, and sometimes round (for they vary in these plants, and might be about three lines in diameter, and an inch high, of a blackish colour, and coriaceous substance, approaching to the nature of the bodies of lithophyta),
 a single

a single flat leaf arises, about an inch or an inch and half broad, thick in its middle to about three lines, ending at the sides in a kind of edge, like a two-edged sabre, almost like the common Alga, formed of longitudinal fibres interlaced with other very delicate ones, and the whole filled with a thick juice, like the *parenchyma* of succulent plants, such as the Sedum, Aloes, and the like, of a clear yellowish green, and transparent. This first leaf is always single, and serves instead of a trunk or stem to the whole plant.

When it rises to about a foot high, more or less, it throws out at the sides other leaves formed of a continuation of the longitudinal fibres; and these second leaves are of the same thickness and substance with the first: they are two or three feet long, and the whole plant is five or six, or more (for one can hardly tell the length); and is not capable of supporting itself, but is sustained by the strength of the waters, in which it floats.

The substance of the plant is not so solid as that of the common Alga, which is capable of drying as it fades, and of being kept: whereas the leaves of this great Alga shrink and wither in the air, become of a blackish colour, and very friable, or indeed soon fall into putrefaction. I never observed, that they bore any fruit: perhaps this was not the season.

But what we find particular in this plant is its root or foot: First, this pedicle extends in ribs, like what we call the thighs of certain trees: these thighs are in right lines: perhaps they run in the same direction or situation, that is, placed north and south, or east and west; but this I could not observe. They are
about

about three or four lines high towards the pedicle, and, ending, are lost. They flourish and spread at the bottom, forming an elliptical bladder, like an egg, flattened above and below, and rounded at the sides, being intirely empty : it is rough without, and very smooth within. This egg, or oval bladder, is exactly round at the ends of the great diameter, but varies a little in the lesser diameter, and forms itself like the body of a fiddle. The under part is a little flattened ; and there is a hole, which is very considerable, in the center of the two diameters. This hole is about an inch wide, and is quite round : it gives passage to the root, or pivot, which I shall by and by mention : the edges appear to turn a little inward : and it is by this hole that the egg fills with sea-water. The whole substance of this bladder or egg is of a coriaceous matter, firm and transparent, and of a clear green ; nor can there be any fibres, either longitudinal or transverse, observed upon it.

The vault at the top, surmounted by the thighs, is as it were granulated ; but at the rounding of the egg it produces a kind of *mammæ*, or little elevations, very round and cylindrical, intirely full ; of the same nature and substance with the egg.

In examining the under part of the egg, we found a second rank of these *mamellæ*, somewhat longer than the first, and at equal distances from one another, in a circular line ; then a third yet longer ; then a fourth, which at the extremities were bifurcated ; and at last a fifth rank, which divided into three, and sometimes into five, branches : these last, placed round the hole, were wreathed inwards, and several were joined together, and only formed a small

body ; and in wreathing themselves thus they close and embrace the pivot mentioned below. None of these *mamellæ* have any apparent opening : their substance is compact, of the same nature with the bladder or egg, that produces them.

Below the trunk and thighs the plant protrudes a pivot, of a like substance with that of the bladder. This pivot, which is large at its origin, proceeding thus from the trunk and thighs, forms something like the knot of the sea-tree : it descends perpendicularly to the trunk, diminishing as it lengthens, and as it grows round ; and then divides into a number of *mamellæ*, branched and wreathed inwards so firmly, as not to be retracted ; of a coriaceous nature, blackish, forming a bunch like what we call the Rose of Jericho. I cannot recollect the name of this plant or flower.

This bunch, or wreathed rose, incloses a heap of gravel, as if petrified or hardened, and ends upon a level with the hole of the egg, exactly as high as the last rank of *mamellæ*, which wreath upon, embrace, and sustain it, leaving always an empty space to let the sea-water pass in, which should fill the inside of the egg or bladder, and even to let in little fishes and shells.

I was surprised to find in one little living muscles, as they always are attached to some solid body by their beards. Now by what means could they enter into this egg ? I conjectured, that they had their beginning there, by the seminal matter of muscles carried in by the sea-water. I also found some small star-fish, whose rays might be about four or five lines long.

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If my stay here had been longer, I had continued my observations; and perhaps should have made some discoveries. It belongs to the academicians of Bourdeaux to push these observations further, if they think proper.

From the Entrance of the
river of Bourdeaux, the
4th of August, 1756.

Peyffonel.

LXXXVII. *An Account of the distilling Water fresh from Sea-water by Wood-ashes.*
By Capt. William Chapman: In a Letter to John Fothergill, M. D.

Whitby, 10th 2d mo. Feb. 1758.

Read April 13. 1758. **T**HY kind acceptance of my last emboldens me to inform thee, how, on my return from a voyage to the north part of Russia, I procured a sufficient quantity of fresh water from sea-water, without taking with me either instruments or ingredients expressly for the purpose.

Some time in September last, when I had been ten days at sea, by an accident (off the north cape of Finland) we lost the greatest part of our water. We had a hard gale of wind at south-west, which continued three weeks, and drove us into 73° lat. During this time I was very uneasy, as knowing, if our passage should hold out long, we must be reduced to great straits; for we had no rains, but frequent fogs, which yielded water in very small quantities. I now