

recommend it, had not repeated Experience convinced me of its Usefulness: And that it may be of Use to Posterity, I mean to Physicians that are really such, I give the Receipt of it to be given to the President and Censors of the College of Physicians, *London.*

VI. *A Letter from the Rev^d Mr. Henry Miles to Mr. John Eames, F. R. S. concerning the Seed of Fern.*

S I R,

IN the Edition which the celebrated *Boerhaave* and *Gaubius* have given us of *Swammerdam's Biblia Naturæ, sive Historia Insectorum*, in *Dutch* and *Latin*, 2 Vol. in Fol. printed at *Leyden* 1737. and 1738. we have an Epistolary Dissertation on the Seed of the Male *Fern*, together with a very curious Cut, representing the Seed-vessels, their Mechanism, and the Seed, as viewed by a good Microscope; inserted at the End of the said History. The Cut I have attempted, with my unskilful Hand, to draw, as well as I could; and, possibly, it may help you to conceive of the Form of what it is designed to represent, in some measure.

The Author, I find, claims to himself the having first discovered the Seed of *Fern*, in his Dissertation, at the Beginning: "You rightly judge" (says he to his Friend) "me to have been the first," &c. *Boerhaave* says,

says, that he shewed them to the Botanic Professor at *Leyden Anno 1673.* and that he had drawn the Figures of them. But I find Dr. *William Cole* sent an Account of the Seeds of divers of the Plants called *Dorsiferous*, to * Dr. *Robert Hook*, in a Letter dated *September 30. 1669.* and gives a pretty just Description of the Seed-vessels, and the manner in which they grow, and intended a Delineation of the Figures. *Swammerdamm's* great Piety, which shines conspicuously throughout his Work, teaches me in Charity to conclude, he spake what he thought to be true; and, possibly, he might have made the Discovery many Years before the time when he shewed the Seeds to the Professor. However, I am humbly confident of this, (after numberless Trials made with all kinds of Microscopes, and in all Positions, and with different Lights) that *Swammerdamm's* Account is just and accurate, in every Point. I have viewed the several kinds of *Fern*, *English Maidenhair*, other sorts of *Maidenhair*, *Wall-rue*, *Harts-tongue*, and find the Seed-vessels of the same Form in all, some little Difference being between some of them in the Size only; and in the manner of their being inserted on the Back of the Leaf, with the Numbers in various Plants, there is a more considerable Difference. I observe, where you have fewer Seeds, you have more of a sort of *Fungus*, or Tubercule, very like what is called *Jews-ears*, which seems to me designed to shelter the Seed, which grow, as under Covert, round about them.—In the Female *Fern*, and *English*

* Who was the first *Englishman* that discovered the Seed of the *Fern* by the Help of a Microscope.

Maidenhair, the whole Surface of the Leaf on the Inside seems covered, so the Seeds guard one another in some measure, though in these I find, after the Seed-vessels are shook off, small Membranes here-and-there on the Surface, a little curled, looking as if they had been raised with the Edge of a sharp Penknife, from the Skin of the Leaf, not altogether unlike the Pieces of Skin we are wont to raise in trying a Penknife on one's Hand.

The Plant which I have attempted a Figure of at *B*, TAB. II. with its Seed-vessels, &c. is the *Filix mas Dodonæi*; on the Inside of the Leaves of which are usually seen several Spots placed in a regular manner, of a Light-brown or Russet.—In this Plant the principal Part of these Spots is the *Fungus* before-mentioned, around which the Seed-vessels are inserted.

The Seed-vessels consist of a Stalk, by which they are inserted into the Leaf, as *cc*, of a springy ribbed Chord *ee*, having a great Number of annular Ribs, exactly resembling the annular Cartilages in the *Aspera Arteria*; and I know nothing in Nature so aptly resembling this Chord, as the *Aspera Arteria* of a small Bird, as a *Robin* or *Nightingale*, &c. This Chord incircles the globular membranaceous Pod, wherein the Seed lies, adhering to it, and dividing it into Two Hemispheres. The Pod *ff* is, in Appearance, composed of a fine whitish Membrane, somewhat like that which lines the Inside of a Pea-shell. The Seeds, *Fig. 3. k*, are irregular in Shape, and in the Surface of them, a little resembling a sort of Net-work, which I have endeavoured, in my rude Manner, to mimic.

In viewing this admirable Production of Divine Wisdom in this Plant, I use a single *Lens*, and no deep Magnifier, that I may have the Advantage of the Light falling on the Objects. I throw a Quantity of Seed-vessels on a circular Plate of Ivory; and, if the Plant be newly gathered, (the proper Time is about the Beginning of *September*) I often have the Pleasure of seeing the Seed-vessels burst; the Motion of which at that time may be seen by a good Eye unassisted. But, when I happened to light of a Pod not thoroughly crisp, I have had the Satisfaction of seeing the gradual Procedure of the Bursting of the Vessel, in order to the scattering the Seed, in the following Manner: First, the Chord breaks, and by expanding rends the *Folliculum* or Pod in Two Parts: By going on to expand itself, as it departs from a Curve, and approaches to a Right Line, it rends itself away from the globular Pod *gradatim*, till it be wholly discharged from it; when, as there can be no further Resistance made to the Chord in expanding itself, it naturally gives a sudden Jerk (which in this Case is very gentle); and thereby the Seeds are shed on the Surface of the Plate, in the same manner as if you were to cast some Grains of Corn out of a Bowl on the Plane of a Table-board: This I have several times seen with unspeakable Pleasure; but where the Vessel is more crisp, the Motion of it in bursting wholly escapes the Sight, flying away with great Violence beyond the Field which the *Lens* takes in. Sometimes I have observed the Pod to be 10, sometimes 20 Minutes in bursting; in which time you may have a distinct View of the Procedure. I would add, that I have more than once seen the Pod broke in the Side by some Accident, as at *l*; and

the Seed lodged within, while the Chord has been whole, and still embraced it.

One might have the Opportunity of seeing this curious Piece of Divine Mechanism to greater Advantage, if I could find a way to get the Seed-vessels from the Leaves in a less rude manner than by rubbing them; for they will not easily be discharged from the Leaves, (for I believe they continue a Month after the Seeds are dispersed) so as to collect any Number of them together, and this Method bursts them. When I have been attempting this, they fly about like exceeding fine Vapour or Smoke, and are very troublesome to one's Hands, &c. by getting into the Pores like *Cowidge*.

In the Paper marked *A*, is a Representation of a small Piece of the Leaf of *Harts-tongue* magnified, taken from Dr. *Grew's* Anatomy, or History of Plants, Plate 72. referred to Book IV. Page 200. I was surprised to see that Cut so little resembling the true Figure: Indeed the Doctor says it was a cloudy Day when he viewed the Object; and I am sure he had no just Notion at all of the Spring which embraces the Pod, as to its Texture; for it is by no means spiral, or like a Screw [I have sent you a little Bit in a Paper, to be submitted to your Examination]; nor do the Seeds grow in that regular Manner, as represented in the Figure.

Whatever Use may otherwise be made of this Discovery, a moral one naturally presents itself to us; *viz.* To admire the infinite Wisdom and Skill of the Wonderful CREATOR: For what thinking Mind can help being struck with Astonishment, when he considers the *Seed-vessels* of a coarse Plant, so minute

as to fly about in the Air like Vapour, but a little Remove from being invisible to a naked Eye, framed with such curious Mechanism, containing a great Number of Seeds, too fine to be kenn'd by the acutest Sight without the help of Glasses!

Your most humble Servant,

Tooting, Oct. 29. 1741

H. Miles.

References to TAB. II.

- Fig. 1. A Branch of the Plant.
 Fig. 2. The Seed-vessels.
 Fig. 3. The Seeds.
 a a. *A Branch of the Male Fern.*
 β β. *Refer to the Leaves, on the Back-side where-
 of, the Excrescencies, like Jews-ears, grow,
 around which grow the Seed-vessels.*
 c c. *The Stalks of the Seed-vessels.*
 d. *A Shoot from the Stalk, producing sometimes
 another Seed-vessel on the same Stalk.*
 e e. *The springy Chord, embracing the Pod, which
 contains the Seed.*
 f f. *The Pod.*
 g. *The Pod with a Crack or Chink in it, to
 represent its being about to be divided into
 Two Hemispheres.*
 h h. *The Chord expanded, approaching a right
 Line.*
 i i. *The Two Hemispheres, when the Pod is
 divided in two.*
 k. *The Seeds.*
 l. *Seeds in the Pod, the Membrane being broke
 and turned up.*

VII. Ex-

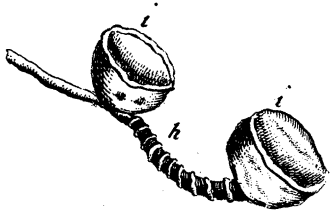
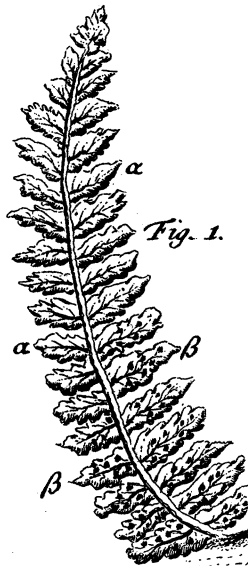


Fig. 2.

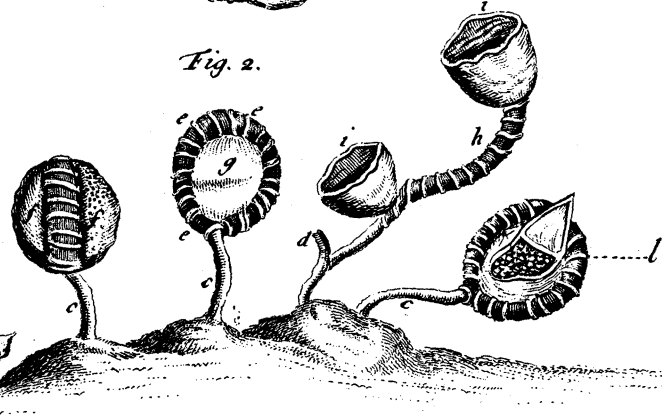


Fig. 3.

