nay, I ſhall not ſtick to ſay that the Increaſe and Nouriſhment of all Plants is included in Water; for let our barren and unfruitful Downs, that conſiſt of a very fine Sand, be brought to ſuch a Level that they lie but a foot higher than the Moats and Ditches round about them, ſo that the Rain water be not drain'd away as it falls, ſuch Land ſhall not only produce good Graſs, but even Rye, Barley, and ſeveral other Fruits.

III. *Some new Obſervations upon the parts and uſe of the Flower in Plants.* *By Mr* Sam. Morland.

THe nice and curious Texture of the Flower and its Furniture, obvious to common view, hath invited and employ'd the enquiries of many Learned and Sagacious Perſons. But ſince theſe noble Searchers into the Hiſtory and Operations of Nature, don't ſeem ſo happily to have reacht her deſign in this caſe as in many others, 'tis hop'd the Ingenious will not diſdain a new attempt to account for the Fabrick and uſe of theſe parts; whereby the propagation of Vegetables will be render'd more intelligible, and the ways of Nature appear more harmonious, and of a piece. It hath been long ago obſerved, that there is in every particular Seed a Seminal Plant conveniently lodg'd between the two Lobes which conſtitute the bulk of the Seed, and are deſign'd for the firſt nouriſhment of this tender Plant.

But the admirable Dr *Grew*, to whoſe generous Induſtry and happy Sagacity we are indebted for the beſt improvements of this part of Knowledge, is the only Author I can find, who hath obſerved that the *Farina* (or fine powder which is at its proper Seaſon ſhed out of thoſe *Thecæ* or *Apices*

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Apices Seminiformes, which grow at the top of the *Stamina*) doth ſome way perform the office of Male Sperm. But herein I think he falls ſhort, in that he ſuppoſes them only to drop upon the outſide or the *Uterus* or *Vaſculum Seminale*, and to impregnate the included Seed by ſome ſpirituous emanations or energetical Impreſs.

That which is now ſubjected to the diſquiſitions and cenſure of ſuch whoſe exquiſite skill doth conſtitute them Judges of ſuch Performances, is whether it be not more proper to ſuppoſe that the Seeds which come up in their proper *Involucra*, are at firſt like unimpregnated *Ova* of Animals; That this *Farina* is a *Congeries* of Seminal Plants, one of which muſt be convey'd into every *Ovum* before it can become prolifick; That the *Stylus* in Mr *Ray's* language, the upper part of the *Piſtillum* in Mr *Tournefort's*, is a Tube deſign'd to convey theſe Seminal Plants into their Neſt in the *Ova*; That there is ſo vaſt a proviſion made, becauſe of the odds there are, whether one of ſo many ſhall ever find its way into, and through ſo narrow a Conveyance.

To make this ſuppoſition the more credible, I ſhall lay down the Obſervations I have made upon the ſituation of theſe *Stamina* and the *Stylus* in ſome few ſpecies of Plants.

Firſt, in the *Corona Imperialis*, where the *Uterus* or *Vaſculum ſeminale* of the Plant ſtands upon the Center of the Flower, and from the top of this ariſeth the *Stylus*, the *Vaſculum Seminale* and *Stylus* together repreſenting a *Piſtillum*. Round this are planted ſix *Stamina*, upon the ends of each of theſe are *Apices* ſo artfully fixt that they turn every way with the leaſt Wind, being in heighth almoſt exactly equal to the *Stylus* about which they play, and which in this Plant is manifeſtly open at the top, as it is hollow all the way. To which we muſt add, that upon the top of the *Stylus* there is a ſort of *Tuft*, conſiſting of pinguid *Villi*, which I imagin to be plac'd there, to catch and detain the *Farina* as it flyes out of its *Thecæ*. From

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hence I ſuppoſe the Rain either waſhes it, or the Wind ſhakes it down the Tube, till it reach the *Vaſculum Seminale.*

In *Capri folium*, or *Honey-ſuckle*, there riſes a *Stylus* from the rudiments of a Berry, into which it is inſerted to the top of the *Monopetalous* Flower, from the middle of which Flower are ſent forth ſeveral *Stamina*, that ſhed their *Farina* out of the caſes upon the orifice of the *Stylus*, which in this Plant is Villous or Tufted, upon the ſame account as in the former.

In *Allium* or *common Garlick*, there ariſes a *Tricoccous Uterus*, or Seed Veſſel, in the center of which is inſerted a ſhort *Stylus*, not reaching ſo high as the *Apices*, which thus overtopping it, have the opportunity of ſhedding their Globules into its orifice more eaſily. For which reaſon I can diſcern no Tuft upon this (as in the former) to inſure their entrance, that being provided for by its ſituation juſt under them.

The Reader, I hope, will excuſe me if I preſent him now with ſome ſuch reaſonings or reflections as the foregoing account doth ſuggeſt, and will ſupport. And I can't but hope to perſwade thoſe that are candid, that I have aſſign'd to the ſeveral parts of the Flower I have mention'd their true and real uſe.

For nothing can be more natural than to conclude, that where a fine *Powder* is curiouſly prepar'd, carefully repoſited, and ſhed abroad at a peculiar ſeaſon; where there is a Tube ſo planted as to be fit to receive it, and ſuch care in diſpoſing this Tube, that where it doth not lye directly under the caſes that ſhed the Powder, it hath a particular *Apparatus* at the end to inſure its entrance. Nothing can be more genuinely deduc'd from any premiſes than from this it may, that this *Powder* or ſome of it was deſign'd to enter this Tube. If theſe *Stamina* had been only excretory Ducts, as has been hitherto ſuppos'd, to ſeparate the groſſer parts, and leave the juice deſign'd for the

the nouriſhment of the Seed more reſerv'd, what need was there to lodge theſe Excrements in ſuch curious Repoſitories. They would have been convey'd any whither, rather than where there was ſo much danger of their dropping into the *Seed Veſſel* again, as they are here.

Again, the *Tube*, over the mouth of which they are ſhed, and into which they enter, leads always directly into the *Seed Veſſel*.

To which we muſt add, that the *Tube* always begins to dye when theſe *Thecæ* are empty'd of their contents; if they laſt any longer, it is only whilſt the *Globules* which enter at their orifice, may be ſuppos'd to have finiſh'd their paſſage. Now can we well expect a more convincing proof of theſe *Tubes* being deſign'd to convey theſe *Globules*, than that they wither when there are not more *Globules* to convey.

If I could now ſhow that the *Ova*, or unimpregnated Seed, are ever to be obſerved without this *Seminal Plant*, the proof would ariſe to a demonſtration; but haivng not been ſo happy as to diſcern this, I ſhall recommend the enquiry to thoſe Gentlemen who are Maſters of the beſt Microſcopes, and addreſs in uſing them. Tho in the mean time, I have made ſome ſteps towards a proof of this ſort, and have met with ſome ſuch hints as make me not deſpair of being able, in a ſhort time, to give the World even this ſatisfaction. For, not to inſiſt upon this, that the *Seminal Plant* always lyes in that part of the Seed which is neareſt to the inſertion of this *Stylus*, or ſome propagation of it into the *Seed Veſſel*; I have diſcovered in *Beans* and *Peas* and *Phaſeoli*, juſt under one end of that we call the *Eye*, a manifeſt perforation (diſcernible by the groſſer ſort of Magnifying Glaſſes) which leads directly to the *Seminal Plant*, and at which I ſuppoſe the *Seminal Plant* did enter; and I am apt to think that the Beans or Peas which don't thrive, will be found deſtitute of it.

But I muſt now proceed to deſcribe ſome other Plants, whereby it will appear, that there is a particular care always

exercis'd to convey this Powder, ſo often mention'd, into a *Tube*, which may convey it to the *Ova*. Now in *Leguminoſe* Plants, if we carefully take off the *Petala* of the Flower, we ſhall diſcover the *Pod* or *Siliqua* cloſely cover'd with an involving Membrane, which about the top ſeparates into many *Stamina*, each fraught with its quantity of *Farina*, and theſe *Stamina* are cloſe bound upon the *Bruſh*, which is obſervable at the end of that *Tube*, which here alſo leads directly to the *Pod*; It ſtands not upright indeed, but ſo bended as to make near a right angle with it.

In *Roſes* there ſtands a *Column*, conſiſting of many *Tubes* cloſely clung together, tho eaſily ſeparable, each leading to their particular Cell, the *Stamina* in a great number planted all round about. In *Tithymalus*, or *Spurge*, there riſes a *Tricoccus* Veſſel, that whilſt it is ſmall and not eaſily diſcernible, lyes at the bottom till 'tis impregnated, but afterwards grows up, and ſtands ſo high upon a tall *Pedicle* of its own, as would tempt one to think that there were to be no communion betwixt this and the *Apices*, which he ſees dying below.

In *Straw-berries* and *Raſ-berries*, the hairs which grow upon the ripe fruit (which I ſuppoſe may be ſurprizing to ſome) are ſo many *Tubes* leading each to their particular Seed, and therefore we may obſerve, that in the firſt opening of the Flower there ſtands a ring of *Stamina* within the *Petala*, and the whole inward *Area* appears like a little Wood of theſe Hairs or Pulp, which when they have received and convey'd their *Globules*, the Seeds ſwell and riſe in a carneous Pulp.

I have obſerved, and can deduce the contrivance and adminiſtration of the parts in all the Plants I have obſerved, and I doubt not but if thoſe Gentlemen whoſe penetration and leiſure is greater than mine, ſhall think fit to apply their thoughts to this ſubject, they will be able to perfect what I have rudely hinted, and from this Theory when ſome ſuch able hand ſhall have done it Juſtice, many Co-

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rollaries may be derived, which will let in light into many parts of Natural Philoſophy. I ſhall content my ſelf at preſent with ſuggeſting, that hence one would conclude that the *Petala* of the Flower were rather deſign'd to ſever ſuperfluous Juices from what was left to aſcend in the *Stamina*, then the *Stamina* to perform this office, either for them, or the unimpregnated *Semina*. And obſerve the Analogy between *Animal* and *Vegetable* Generation, as far as was neceſſary there ſhould be an agreement between 'em.

The Explication of the Figures.

FIgure the 23 repreſents a yellow Lilly. A. the top of the *Piſtillum* or Tube, at which the Seminal Plants are ſuppos'd to enter, and thro which they are convey'd to the unimpregnated Seed in the Seed Veſſel.

b b b b b b. The *Apices Seminiformes*, which when they are ripe open, and ſhed that Powder which enters the Tube at A.

C. The place of the Seed Veſſel at the bottom of the Tube, the Seed Veſſel itſelf being conceal'd under the Leaf in this Draught.

Figure the 24th. D. The *Siliqua* in a Flower of the Pea-kind.

E. The Tube which ariſes from the *Siliqua*, and conveys the Plants to it.

F. The Membranous Coat that involves the *Siliqua* laid open.

g g g g g g. The *Apices*, which before the Membranous tegument is laid open, appear to riſe from its edges, and by the *Petala* of the Flower are kept cloſe upon the Orifice of the Tube, that they may conveniently ſhed their *Farina* into it.

Figure the 25th. A *French* Bean repreſented ſidewiſe.

Figure 26. The ſame open'd.

h. The Seminal Plant.

i. A Perforation, at which, 'tis ſuppos'd, the Seminal Plant firſt enter'd.

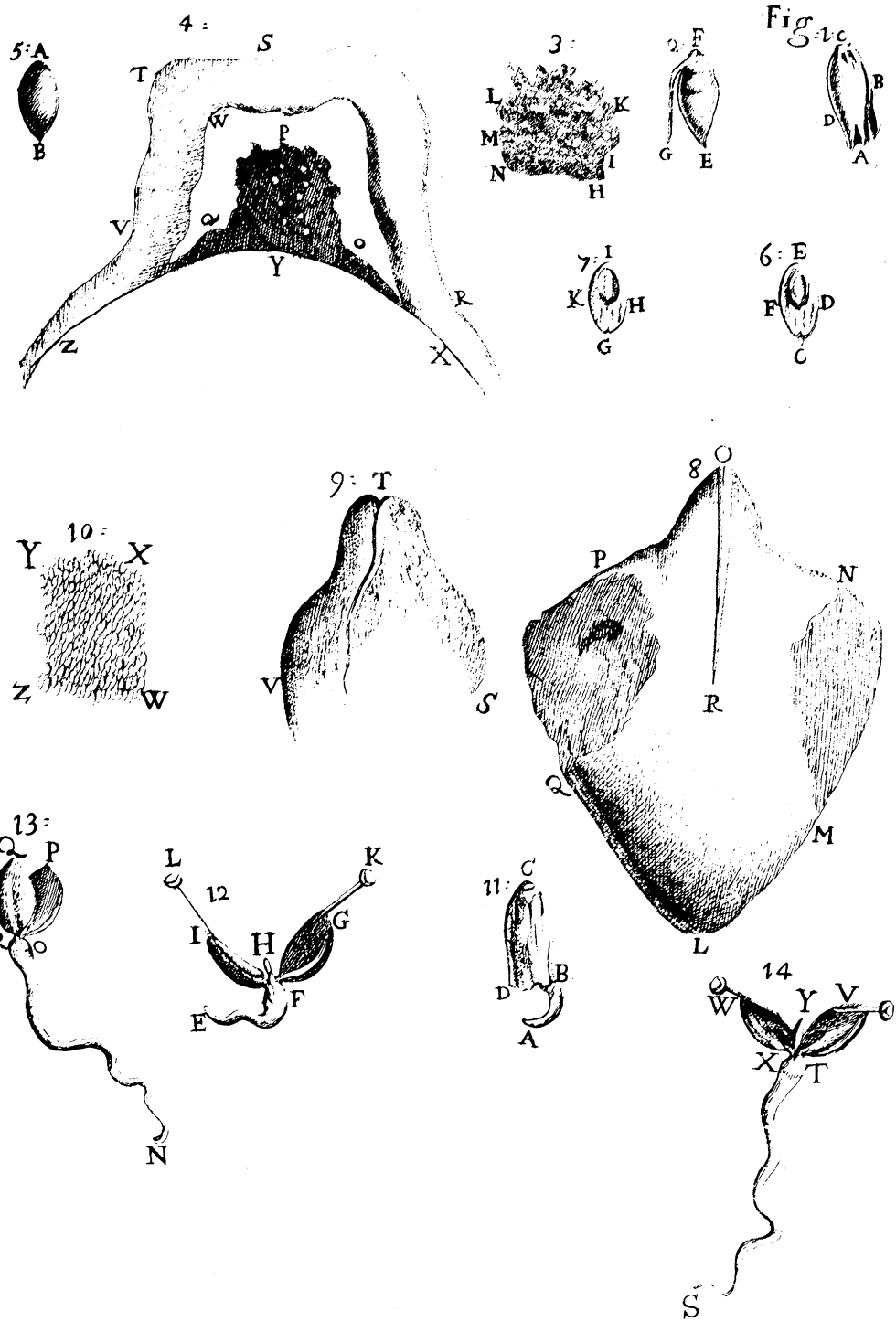
Fig. 1.
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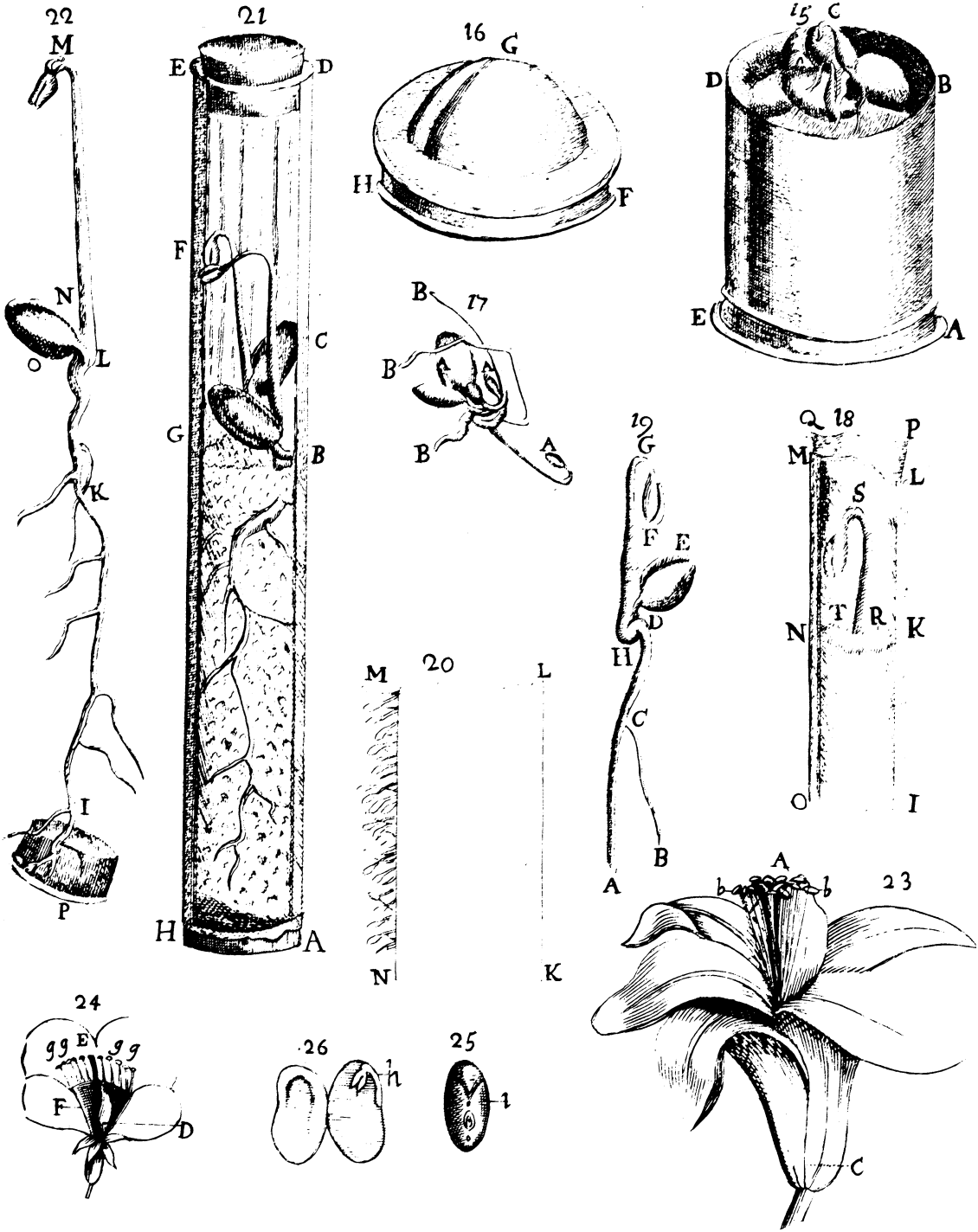
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