II. *Part of ſome Letters from Mr* Anthony van Lewuenhoeck, *F. R. S. to the Royal Society, and the Right Honourable the Lord* Somers *their Preſident, containing ſeveral Microſcopical Obſervations and Experiments concerning the* Animalcula *in* Semine Maſculino *of Cocks and Spiders, Shortneſs of Breath,* &c.

Delf, Decemb. 1701.

I Take the Liberty of ſending your Lordſhip ſome little Figures and Obſervations which I made partly the laſt year, and partly this.

In my Letter of the 25th of *Decemb.* 1700. I told the Society that I had made ſome Remarks on the *Semen Maſculinum* of a young Cock that was but half grown, and that I ſhould conſider it farther before I gave you my Thoughts upon that ſubject.

I have often obſerved, that young Cocks that are not arrived to half their Growth were wont to Teaſe the young Hens to couple with them, which theſe laſt always refuſed till they had laid Eggs, that is to ſay, till they were 3 or 4 months old.

This made me conclude that when the young Cocks were thus ſtimulated to Copulation, the *Animalcula* in their Seed were living, which upon view I always found to be ſo, as did many others to whom I imparted the ſtrange ſight of infinite numbers of theſe Living Creatures; and the laſt perſon that view'd them through my Microſcopes was of opinion that he ſaw Millions of thoſe little Creatures, tho the whole Drop of Seed in which they lay was to the Naked Eye no bigger than a great, but ſingle Sand.

Laſt Summer I open'd the Seminal Veſſels of a young Cock that was newly kill'd, pluckt, and ſtill warm; in which I likewiſe diſcover'd theſe *Animalcula* ſtill living; and they remain'd alive for the ſpace of half an hour after I had ſqueez'd a Drop of the Seed out of the ſaid Veſſels.

I was formerly of opinion, that the *Animalcula in Semine Maſculino* of a Cock (as they then appear'd to me, both ſwimming in their Fluid Matter, as alſo after they were Dead) were in Shape like our River-Eels, but by my late Obſervations I find I was miſtaken in my Thoughts; for now they appear, both in motion and when they lye ſtill, as if the fore-part of their Body were crooked or Circular.

Not content with my own Obſervations, I took a great deal of pains to give the Limner a Diſtinct View of them; which happen'd very well, and is as follows.

Tab. 1. Fig. 1. A B C D Repreſents one of thoſe little Creatures in its whole length, whereof A B C is the Body, which is ſeldom quite ſtraight, but the Tail moſtly folded; and that was the occaſion of my error; for when I view'd them formerly, I thought I had ſeen their whole Body, whereas I now diſcover'd a long and exceeding ſmall Tail, which is ſhown by C D.

Theſe Tails were ſo wonderful fine, that I had much ado to make the Limner perceive them, for by reaſon of their ſmalneſs, they often eſcape the ſharpeſt ſight.

In the fore-part of the Bodies of many of thoſe *Animalcula* I diſcover'd a clear bright place, which was not to be ſeen in others; and the Tails of all theſe little Creatures that lay dead were ſo many Bows, which I caus'd the Limner to deſcribe in Tab. 1. Fig. 2. 3. 4. and 5.

From hence, I ſuppoſe, it is, that when I mentioned the *Animalcula in Semine Maſculino* of other Creatures, I took no notice of their long Tails, which without doubt they were provided with, as well as theſe in the Seed of young Cocks.

On

On the 17th of *Septemb.* 1701. about 10 of the Clock in the morning, I view'd again the *Semen Maſculinum* of a young Cock, which the Poulterer judged to be about twelve weeks old, it had been kill'd an hour before, and found the *Animalcula* full of Life.

I took ſome of the ſame Seed, about the quantity of a great Pin's head, and ſo order'd it, that very little of the fluid Matter could exhale.

I obſerv'd this Matter every hour, and in the ſame evening about ſeven of the Clock I found the *Animalcula* as lively as if they were proceeding from a Cock that was newly kill'd.

But about 8 or 9 a clock I could perceive that many of the *Animalcula* were dead, and that in one place, the ſpace whereof was no larger than a Sand, there were great ſholes of them living; but a little further, and in a place of much the ſame extent, I could not diſcover the leaſt Motion in thoſe that lay there.

The 18th of *September* in the morning, about ſeven a clock, and alſo at noon about twelve, I again made my Obſervations of the ſame Seed, as it lay in a Glaſs Tube, of the largeneſs of a thick Pin, but I could ſee no life in the *Animalcula*; but when I lookt upon another part of the ſame Matter, of the bigneſs of a great Sand, and ſpread very thin upon the Glaſs, I ſaw a great many very lively and nimble in their Motion, but their Life and Motion dwindled away till at laſt I could perceive none; the reaſon of which I judged to be, that the thin fluid Matter was all exhaled from the Seed, and that then the *Animalcula* dye preſently.

To ſatisfy my ſelf farther in this matter, I took a dead Cock that had been kill'd and pluckt the day before, between the hours of ſeven and nine in the morning, and opening the Body, I pull'd out the Guts and the Stomach, that I might the better come at the *Vaſa Seminalia Deferentia*, I ſqueez'd out of one of the Seminal Veſſels a Drop of

the Seed, and preſently ſetting it before my Microſcope, I could ſee an infinite number of thoſe *Animalcula*, ſwimming in Legions together, and croſſing one another like Clouds in a ſtormy day, and as Brisk and Lively as if the Cock had been newly kill'd.

That part of the Intrails which I had taken out of the Cock, I put into the Body again, and drew the Skin over it, in order to take out a little more of the Seed about ſix hours after.

At noon accordingly I took out a little of the Seed, and found the *Animalcula* in the ſame ſtill living.

But in the evening about ſix having again taken ſome of the *Semen* out of the *Vaſa Deferentia*, I could not perceive any of them living.

Then I open'd thoſe Veſſels in ſeveral places, even where they terminate in the Teſticles, but the *Animalcula* were all dead.

Seeing now the *Animalcula* in *Semine Maſculino* are living when taken out of the Body of the Cock, warmth ſo long after the Cock itſelf is dead, who knows but as the ſame are placed for to faſten in the *Ovarium* or Eggneſt of the Hen, not one Yolk, but many, which compoſe the Bed of Eggs, and ſo to impregnate them; the more becauſe we find, that with one Coition of the Cock and the Hen, moſt of the Eggs which the Hen lays in a month or two, are impregnated.

I have often thought too, whether or no the Yolks of the Eggs being in the *Ovarium*, and not having attain'd the hundredth part of their Growth, are not made for each of them to receive one of thoſe *Animalcula* from the Seed of the Cock, and to keep it there till the Yolk of the Egg be ſurrounded by the White, and the neceſſary Heat introduced; the more, becauſe we know that out of the White of the Egg the Chicken receives its firſt Growth.

Delft

Delft in *Holland, Decemb.* 20. 1701.

WIth the preſent I ſend you my farther Obſervations about Spiders, upon which ſubject there occurr'd to me what follows.

A certain Gentleman, that had often conſider'd the nature of Spiders, and their Copulation, told me that one could ſeldom meet with the Males of the great Spiders, and that he believed the Females did kill and eat up the Males.

This Gentleman had order'd his Gardener to kill no Spiders.

This Gentlemans Garden was large, and full of low Fruit-Trees, ſo that the great numbers of Spiders in thoſe Trees were very viſible to us; and I was told by the ſame Gentleman, that where we ſaw the Females of the ſmaller ſort of Spiders, there was alſo one Male; and I have obſerved the ſame.

Now that which this Gentleman took for the *Membrum Virile*, was quite otherwiſe, and I told him he was miſtaken; for the more I view'd them the more I was convinc'd that they were two Working Inſtruments, wherewith the Spiders take up their Food, and uſe alſo inſtead of ſhort Feet.

This my Aſſertion ſeem'd to the Gentleman Incredible; but when I placed the Working Inſtruments before my Microſcopes, and gave him a Proſpect of them he was fully ſatisfied; adding, that they could not be the *Membrum Virile*, and that unleſs he had ſeen them thro the Microſcopes, he ſhould never have believed them to be otherwiſe.

Moreover, ſince that time I have often been in places where Thiſtles, Nettles and other Weeds grew, where I ſaw ſeveral ſorts of Spiders, and in great numbers; and obſerv'd that when the Male Spiders approacht the Females

males, in order, as I thought, to couple, the Females always put the Males to flight.

I have ſeveral times taken up the Male Spiders, that I might obſerve their Seed, and have been fully ſatisfied that that little white Matter which I ſqueez'd ſeveral times out of the hinder part of their Bodies, and which was ſometimes as large as one grain of Sand, and ſometimes a little bigger, was nothing elſe but the Male Seed of theſe Creatures; I diſcover'd therein an infinite number of *Animalcula*, which continued ſo long living, till I was wearied with beholding them.

Theſe *Animalcula* were ſo exceeding ſmall, that I believe a thouſand millions of their Bodies joyn'd together would not be equal to a large grain of Sand, yet I will rather compare them (that I may be ſure not to be miſtaken) to a Barley Corn for bigneſs.

By reaſon of the infinite ſmalneſs of theſe Creatures, it was impoſſible for me to repreſent the Figure of their Bodies, nor of the Inſtruments thereof wherewith they moved ſo ſtrongly, as to continue living above 5 hours after they were ſeparated from the Bodies of the Spiders.

I had 10 or 12 other Male Spiders, in which I could diſcover no new *Phænomena*, ſo that I took it for granted that the *Membrum Virile* of theſe Creatures is in the hinder part of the Body, tho I never was ſo lucky as to obſerve an actual Copulation.

'Tis true, that in all the laſt Spiders I could perceive no Seed at all; but that I attributed to theſe reaſons, either the Male Seed was not yet Ripe enough in them, or it may be they had lately coupled before I took 'em. It has ſometimes happened to me, that in the preſſing their Seed out, I mixed their Excrements with it.

Since theſe Experiments I ſhut up ſeveral Spiders in a Glaſs Tube, and amongſt others 3 Males and 1 Female together, and after the ſpace of 2 days, I ſaw the Female fall upon the Males with ſuch violence, that the Blood

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ran out of their Feet; whereupon I kill'd the Female, and the next day I ſaw two of the Male Spiders lying dead, and the remaining Male Spider was eagerly devouring the Female.

I had three other Male Spiders that I had ſhut up in the Glaſs Tube twice 24 hours, and ſo having hinder'd them all that time from coupling with their Females, I concluded I ſhould find ſeed enough in all of them, and ſo indeed it happened, and I obſerv'd the *Animalcula* alive in it.

Delft in *Holland*, *Febr.* 14. 1702.

I Have been mightily perſwaded by ſeveral Gentlemen to ſend you the following Obſervations, together with the inclos'd Figures, if perhaps they may be of uſe to ſuch as are troubled with *Shortneſs of Breath.*

Some time before the King went for *England*, I had frequent Diſcourſe with a certain Phyſician about the Curing of Shortneſs of Breath; who told me, that he was well acquainted with all the ſorts of Balſam that were eſteem'd uſeful in that Diſeaſe, but that it was impoſſible to find any Vehicle that could inſinuate them effectually into the Lungs, and that in vain do they anoint the Breaſt and Stomach with Balſams that could never reach the Lungs, and that the Scent of the Balſam which exhaled from thoſe that us'd to anoint their Breaſt with Oyl, does not exhale from the Pipes of the Lungs, but was evaporated from the Breaſt by the Neck.

I was alſo perſwaded of the Truth of this Aſſertion, becauſe I am convinced that nothing that is in the Stomach or Bowels can be convey'd to the Lungs, unleſs it has firſt paſt thro the Heart; and conſequently much leſs can Balſams,

ſams wherewith we anoint our Breaſts, find any Paſſage into the Lungs.

Having conſider'd this Diſcourſe ſome days by my ſelf, and upon the ſixth of *January* laſt finding a very Learned Gentleman at my houſe, we fell into talk of *Shortneſs of Breath*; and I told him that the only means I could think of, to inſinuate the Inviſible Particles of Balſam into the Lungs, was to take a little piece of Silver or Copper, of the bigneſs of a Shilling, and making a ſmall hole in it, to fill the Cavity with a little Balſam proper for the Lungs of one that is troubled with a Shortneſs of Breath, and when that is done, let him place it upon the Tongue, and ſtopping his Noſtrils, let him admit no Air into his Lungs but thro his Mouth, nor Reſpire thro his Noſtrils, by which means the Subtil Particles of the Balſam, which I'll call the Spirits of it, may exhale and deſcend into the Pipes of the Lungs.

This Project of mine was approved of by the aforeſaid Gentleman; who added, that he did not doubt but I ſhould ſtill improve it if I thought farther upon that matter.

After the Departure of the ſaid Gentleman, I took two Glaſs Tubes, one of nine Inches, and t'other of eighteen long, and of half an Inch Diameter.

I made ſeveral Bends in theſe Glaſs Tubes, and made a ſmall Hole at the end of each of them, fit for my purpoſe, and in order to put it into one's Mouth, and filling it half full of Balſam, I placed it horizontally, that the Air paſſing over the Balſam might be convey'd into the Lungs, more ſtrongly tinged with the ſaid Balſam than it could be by the other Project.

But taking Counſel of my Pillow, I rejected this way alſo, and the next morning I took a Glaſs Tube, that was 15 Inches long and about one Inch in Diameter, as is deſign'd by Tab. 2. Fig. 1. A B C D E, *&c.*

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That end which is put into the Mouth, in order to draw in the Air, is repreſented by DEF.

This Glaſs Tube being open at AIK is to be fill'd with a piece of Linnen, which we call Gawſe or Muſlin, or elſe a little bit of Spunge, of ſuch a ſize that it might be put into the Tube without preſſing, and that a Thread or String might be faſtned to it, in order to pull the Spunge or Linnen out of the Tube, as is to be ſeen in KL, and this Rag or Spunge is to be moiſten'd in Balſam good for the Lungs, before it is put into the Tube. See BCGH.

But conſidering, that if the ſaid Spunge did not touch the ſides of the Glaſs in every part, the Air would paſs by it, where there was no reſiſtance, as alſo that the Air would difficultly paſs thro the Linnen or Spunge that was dipt in Balſam, eſpecially if that were thick, I rejected this Tube alſo, and took another of the ſame length and breadth with the former, ſave only that this laſt Tube was very near of the ſame ſize throughout.

I rejected this Tube alſo after all my preparations, and I took another Tube of the ſame length and bigneſs with the former, with this difference only, that it was throughout of the ſame ſize.

This Tube, which is repreſented by Tab. 2. Fig 2. MNOP, *&c.* I ſtopt at each end with a Cork as at MNWX and PQST.

In the uppermoſt Cork PQST, I made a little round Hole quite thro, wherein I ſtrongly inſinuated a ſmall Glaſs Tube R, and ſo alſo I perforated the other Cork MNWX.

Having done this, I thruſt into the lowermoſt Cork another long Crooked Glaſs Tube which I had prepared on purpoſe, and it is deſcrib'd by the Letters YZ.

This laſt Tube YZ was taper'd into a ſlender end as Z z, with the intent, that the Air when ſuckt in at R ſhould come in leiſurely at the ſtrait paſſage ZA.

Having thus diſpoſed the great Tube, with the Cork ſo ſtrongly skrew'd in it, and the ſmall Tube in the Cork, that

not only no Water, but even no Air could enter therein, I judged that I had quite finiſht my Machine.

To make an Experiment how it might ſucceed, I drew the Cork P Q S T out of the Tube, and pour'd a little Brandy into it as in N O V W, and then having placed the ſaid Cork with the little Tube in it, into the great Tube again, and putting the ſmall Tube R between my Lips, and ſucking in the Air, which ruſht in at the ſmall end a of the Tube Y Z, and which was obliged to paſs thro the Brandy, I perceiv'd the Brandy to be put into a violent agitation and bubbling, and thereby the Spirits thereof, if I may ſo call them, made to riſe in an extraordinary manner up into the Mouth, and conſequently into the Lungs, as the Event did plainly demonſtrate.

If then the Exhalations or Volatile Particles of Balſams are render'd ſerviceable, not only for the comforting, but even for the curing of Weak and Crazy Lungs, and the more Spirits of theſe Balſams can be convey'd into the Lungs, the better will they fare, but I would not have the Air paſs ſo ſimply thro the Balſam, as it went thro the Brandy, when the Tube ſhould be filled with the former ſo far as it was with the latter, but intended to put the Glaſs Tube, ſo far as it is filled with Balſam in hot Water; however, in order to prevent the burſting of the Tube by too ſudden a Heat, it ought to be laid in a Baſon fit for the purpoſe, with ſome cold Water, pouring ſoftly a little boyling Water upon it to the height of the Balſam, or elſe to lay the Tube in a Baſon with the neceſſary quantity of Water, and put it upon Fire.

By this means the Spirits of the Balſams will exhale much more freely than if the Balſams were cold, and the Lungs will be ſo heated thereby (in my opinion) as to put the Patient into a gentle Sweat.

I have often thought with my ſelf too, that theſe Balſams, or at leaſt ſome Cordial Gums, Herbs or Juices, are not only good againſt Shortneſs of Breath, but alſo

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will preſerve the Lungs from cold ſtinking Miſt, and Peſtilential Airs.

I have been told, that the beſt Balſam for Shortneſs of Breath is the Balſam of *Peru*, which I never ſaw, neither did I intend to make the above-mentioned Inſtrument a Vehicle for Balſams, for I freely own, I have no skill of Balſams of Gums or Herbs, only this I have often experienced, that ſtinking ſmells are prejudicial to my Lungs.

I don't deſign to invite any body to make uſe of the ſaid Tube, beſides I have preſented it to an able Phyſician, who is well vers'd in thoſe Balſams, Gums, and Juices, that are good for the Lungs.

That Learned Perſon, that I mention'd before, ſetting the Tube to his Mouth, and breathing in the Spirits of the Brandy, I told him that we need not ſtop our Noſe when we draw in our Breath, but only remove the Tube, Tab. 2. Fig. 1. D E F from the Mouth, and then Breathing, to apply the Tube again to the Mouth; and this one is to repeat ſo long as one ſhall find any benefit by it; this Gentleman, I ſay, was ſo pleaſed with the Experiment, that he adviſed me to make it Publick, that the World might be the better for it.

Now in order to make the Glaſs Tube, Fig 1. as uſeful as the other, Fig. 2. I prepared ſuch another Inſtrument as is repreſented by Tab. 2. Fig. 3. A B C D E F, that I might place the Cork A B C D in Tab. 2. Fig. 1. at A I; and I made this Inſtrument or ſlender Glaſs Tube longer than that which in Fig. 2. is repreſented by Y Z a, upon this account, *viz.* that if one were inclin'd to put more Balſams or Juices into the Tube, this long Pipe might be thruſt up higher into the Water.

Now if we conſider the Structure of our Bodies, as far as they are known to us, we may firmly conclude that no part of us is expoſed to ſo many Evils as the Lungs, for how eaſily may they be hurt if we do but go into the Cold Air, which engenders and cauſes us to diſcharge Phlegm,

to Cough and Spit, for how eaſily may the Globules of Blood in the fine Veſſels of the Lungs be coagulated by the Cold.

In order to get a further Light into theſe matters, I took the ſmalleſt of the Lungs of two ſeveral Sheep, that I might view thoſe parts with the Microſcope, and I was amazed to diſcover that the Air Veſſels were filled with *Pus* or Matter, even at the extremity or ſmalleſt part of the Lungs.

I got a Butcher, that was a good underſtanding man, to come and view the ſaid Lungs, and I ask'd him what was the Diſtemper of that Sheep; he felt the Lungs in ſeveral places, and ſhow'd me ſome hard parts about the length and breadth of two Fingers, and told me that that Sheep had caught cold, and that had occaſioned that Diſeaſe of his Lungs; and the ſame thing was atteſted by ſeveral other Butchers; I askt them whither the Sheep would not have died of that Diſeaſe, but was anſwered, that thoſe hard places often *diſappear* and remove again.

I could not diſcover the leaſt *Pus* or Matter in the Air Veſſels of the Lungs of two other Sheep, thoſe Lungs were of an agreeable Colour, and like the other.

Having view'd the outſide of the Lungs of a Sheep that had not been diſtemper'd, it ſeem'd to me that a great many ſmall Tranſparent Globules lay under the Membrane; but when I ſeparated the Membrane from the Liver, thoſe Tranſparent Globules appeared to be nothing elſe but ſmall Particles of Air preſt together into different and irregular Figures; and thoſe Air Globules ſeem to lye out of the Air Veſſels.

I took ſeveral pieces of the Lungs, and preſt the Blood out of the Veſſels in which it lay, as alſo their Air, and was amazed at the infinite number of Bubbles of Air that came out of the Veſſels, of which ſome of them were ſo exceeding ſmall, that they even eſcaped the ſight of my Microſcopes; thoſe Globules I did ſuppoſe to be contained

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in very fine Veſſels, and when the Blood and the Air was ſqueez'd out of that part of the Lungs where there were no great Veſſels, the remaining ones, whoſe Tunics were exceeding fine, made together but a very ſmall Portion of Matter.

Moreover, I took the unſound Lungs of two other Sheep, and found in the handling that their parts were much harder than others that were not diſtemper'd, and that the Matter or *Pus* was ſtiffer or thicker in thoſe Lungs, than in the above-mention'd: looking on the external parts of theſe Lungs, I perceived in ſeveral places thereof Pellucid Particles, which far exceeded in largeneſs the Globules of Air ſpoken of before.

Theſe clear Particles were in ſome places of a greyiſh colour, but in others ſomething darker.

Having taken the laſt mentioned Particles out of the Lungs, they ſeem'd to be nothing but a hard *Matter*, and the more, becauſe upon parting them I could ſee no Air Globules among them; whereas in ſound Lungs, how ſmall ſoever the pieces thereof were, I could eaſily diſcover that (except the Veins) they conſiſted moſtly of Air Globules, which were not ſhut up within the Veins.

Now if the ſaid Tranſparent Particles were not in ſound Lungs, I ſhould conclude that all thoſe Particles would turn to a thin *Matter*, in order to be caſt out of the Lungs by the Sheep if it ſhould recover its former health.

If we look upon ſound Lungs, we ſhould be apt to affirm that thoſe alſo conſiſted of ſuch Tranſparent Particles, but upon a nearer view, I found that that Phenomenon was only occaſioned by a multitude of Blood Veſſels lying within the Membrane of the Lungs, and in ſeveral places ſeeming to divide the Globules of Air.

Being perſwaded now that all the Diſtempers in the Lungs of Sheep are occaſion'd by the Cold Air which theſe Beaſts ſuck in, I ask'd two Butchers where they thought the Diſeaſes of their Lungs to proceed, they anſwer'd, that

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the Sheeps running in the Meadows at the latter end of the Autumn, and eating Graſs that was either actually frozen, or cover'd with cold Dews, was the true reaſon their Lungs were thus ſpoil'd; and that the ſame happen'd ſometimes in *May*.

But for my part, I ſhould rather conclude that the frozen Graſs does not hurt their Lungs, but Stomachs, and that the cold Air does not affect their Lungs.

Knowing that our Butchers fetch abundance of Fat Sheep from *Brabant*, and that thoſe Sheep are driven every morning into the Field, and folded every night by their Shepherds; and that our Sheep, on the contrary, are brought into the Meadows in *May*, and there left till it Snows and Freezes; I askt the Butcher whether the *Brabant* Sheep had ſuch bad Lungs as ours; and was anſwer'd, Seldom or never.

From whence I was ſtill better ſatisfied, that the Diſeaſes in the Lungs of Sheep, and eſpecially of ſuch as lye in the Field in the long cold Nights, were occaſion'd by nothing elſe but their ſucking in the Cold Air.

I askt moreover whether ſuch Sheep were Fat whilſt they were kept up, and whether they could diſtinguiſh while living which had bad Lungs; to which they anſwer'd, that thoſe whoſe Lungs were toucht, did never increaſe in fat after they were ſtall'd; and that within a fortnights time after they had been ſhut up, and fed with Beans in order to fatning, the Diſtemper uſually diſcloſed it ſelf, for they did nothing but Cough, and therefore they always kill'd thoſe Sheep firſt.

Now if we allow that the Cold Air is ſo prejudicial to the Lungs, we ought not to wonder if ſuch an Inconvenience (as we call a Cold) comes upon them, tho we are able to diſcover from whence it proceeds.

Yea, I am of opinion, that in a long cold Winter the Lungs may be ſo much incommoded, that a great fit of

Sick-

Sickneſs, and even Death itſelf, will be the Conſequence of it; for if we do but conſider what a deal of Phlegm one diſcharges in that Sickneſs which we call a Cold, and if it be Greeniſh it is almoſt a Purulent Matter, which comes out of the Air Veſſels of the Lungs, we are preſently frighted at it, and with reaſon, for the Diſeaſe may proceed ſo far that a Conſumption of the Lungs will follow.

My laſt long Sickneſs was ſuch a Cold, and it ſtuck ſo cloſe to me, and I voided ſo much Green Phlegm that I was afraid I ſhould never recover it; but I am now ſo well, that in the morning when I cough, it is nothing but a clear thick Matter of the quantity of a Grey Pea; from whence I conclude, that the Blood circulates naturally and freely thro the very ſmalleſt of the Veſſels of my Lungs, and that that clear Matter is nothing but an exhalation thro the Fibres of the fine Blood-Veſſels, and is the Serum of the Blood.

Having lately ſmelt ſome Cinnamon that was pounded in my Houſe, I thought of what Dr *Bontekoe* ſays about that Spice's being a great ſtrengthener of the Heart. I took therefore a fine piece of Cambrick, and put into it about 2 Thimbles full of ſtrong, and well beaten Cinnamon, and tying it up, placed it in the Glaſs Tube, Tab. 2. Fig. 1. B C G H. Then I ſet my mouth in that part of the Tube, markt E, and drawing in my breath at the ſame place, I could plainly perceive the inviſible exhaling particles of the Cinnamon to deſcend into my Lungs.

This Cinnamon being thus derived into the Pipes of the Lungs, we can't ſay that it ſtrengthens the Heart, but rather the Lungs, unleſs we will affirm that the one partakes of the advantage of the other.

III. *Ano-*

Tab. 2

Fig. 2.

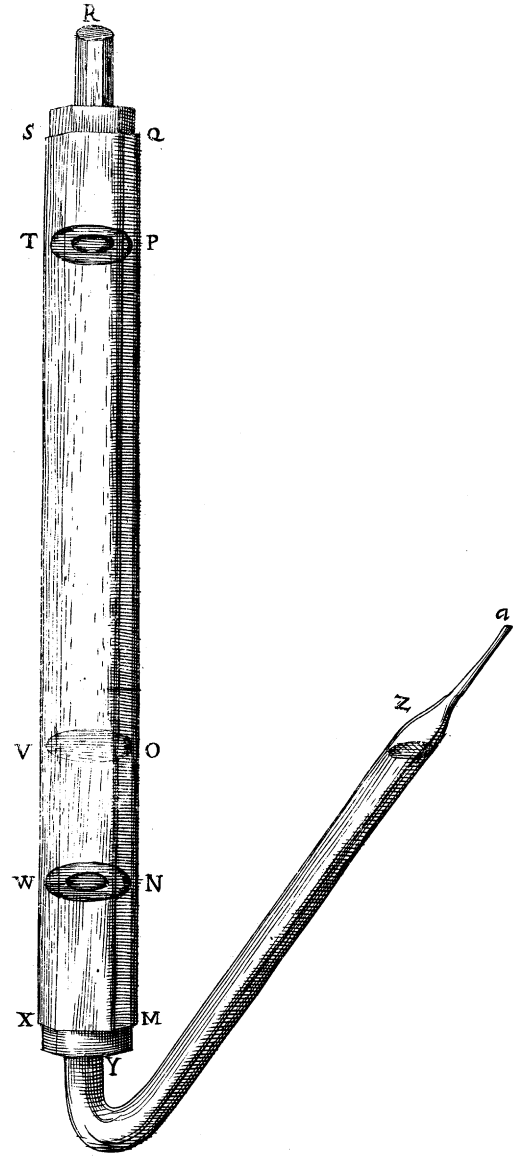

Fig. 1.

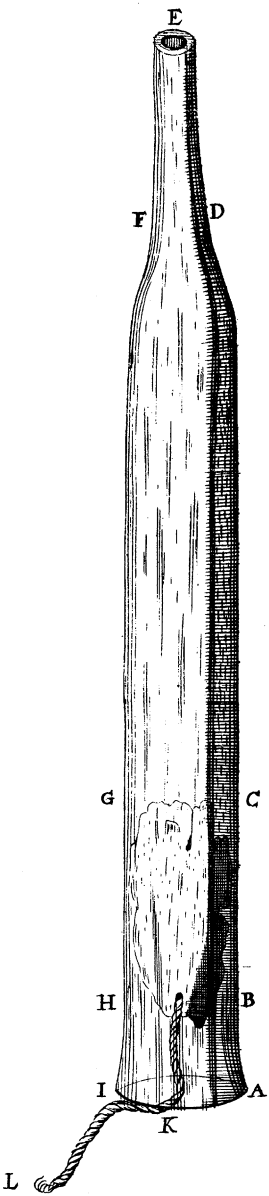

Fig. 3

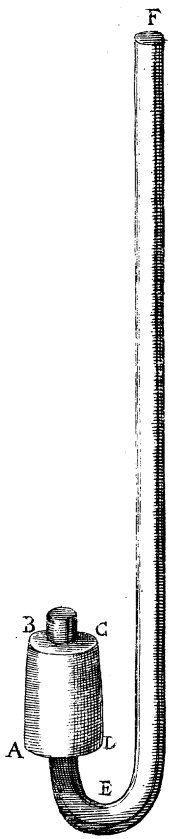

Fig. 2

Tab. 1.