

I. *Some Remarks upon the Disposition of the Parts, and Microscopical Observations upon the Contexture of the Skin of Elephants. In a Letter from Mr. Anthony van Leeuwenhoek, F. R. S.*

*Delft in Holland, April 12. 1712.*

**I**T is some Years ago, that there was an Elephant shewn about for Money at the *Hague*, the biggest that ever I saw. Casting my Eyes upon the hinder part of her, in order to observe the *Matrix*, I could not discover the least appearance thereof; which seem'd to me very strange. But it happen'd, whilst I was curiously viewing this great unweildy Creature, that she made Water; but not like our four-footed Creatures, from whom the Water issues, as it were, in a Stream; for from this Creature it burst out all at once, just as if any Liquor were poured out of a Can, top and bottom all together: And I observed, that the Skin, out of which the Water flowed, was extended, or thrust outwards about the space of three Fingers breadth; and the Orifice, or opening of the Skin in that place, seem'd to be so large, that one might thrust ones Fist into it: And that part, from whence the Water was discharg'd, was not situated, as it usually is in our four-footed Beasts, under the Tail, but in the Belly, and very near that part where the Navel grows in our Creatures.

This appear'd to me to be a very particular Discovery; the more, because I remember'd I had often read, that when the time came for the Copulation of Elephants,

phants, the Female Elephant used to prepare herself a Bed with the Boughs of Trees, and then cast herself upon her Back on them; but none of the Authors that I had read, gave their Reasons for her doing so.

Casting my Eyes upon the fore Legs of the Elephant, I observ'd growing upon the upper part of the Body, or about the Breast, two Nipples, which in Cows we call Dugs, quite contrary to those of Mares, Cows, &c. whose Dugs are plac'd near the hinder Legs. But when we consider farther of the Matter we must conclude, that Nature has so order'd it, in relation to the Elephant, for the Benefit of her young ones, whom she could not suckle, if her Dugs had been plac'd between her hinder Legs; for by reason of the Position of the Mouth under the Trunk the young Elephant can't suck its Dam; but the old one sucks at her own Breast, and by the help of her Trunk conveys the Milk into the Mouth of the young one.

After these Observations, I viewed the Skin of the Elephant, which was very rough; upon which, discoursing with the Keeper, I was told that that Roughness fell off every year.

I therefore intreated the Keeper that he would with a Knife scrape off a little of that annually falling Roughness: But he at first refus'd my Request; yet after I had assured him, that I would Reward him well for his Pains, he readily consented to my Request, and scrap'd off a little of the said Skin upon a Paper.

Since that time I have view'd the scrap'd off Particles of the Skin, and always imagined that the most part of it was a protruded Matter, which had not nourishment enough to turn it all into Hair; and that what became Hair was very short and thin, in proportion to the bigness of so great a Body; and the Hair which is upon the Tail of the Elephant, is much thicker than that  
which

which is upon the other Parts of the Body. But as I more nicely view'd the scrap'd off Particles of the Skin, I discover'd in some of the Particles short small Hairs, the Roots of which were sticking outwards in that part which is joined to the Skin.

The Particles that were scrap'd off from the Skin of the Elephant, were crumbled into as small pieces as are describ'd by Figure 1. A. B. C. D. E. A. was a Particle on which there had been two Hairs, but by the Microscope one might discover four.

When these Particles were scrap'd off from the Skin, some of 'em were thick, and as it were united to each other; but they were easily divided into such Particles as are describ'd by the aforesaid Fig. 1.

This yearly shedding of the Matter that is upon the Skin may be thus accounted for: When the time comes that there is no Increase of the Hair, but that it is, as it were, at a stand, as we see in other Creatures that shed their Hair, the same thing happens to the Elephant; the Hair of which, as thin and as short as it is, for the most part falls off, and the encrustated Particles which stick to the Skin must also fall: And those Particles lay as close to one another as if they were united, being surrounded with flattish Sides in the manner they are shewn by Figure C. upon which there was remaining a small Particle of Hair or Wooll.

Having nicely view'd one of those Particles that are describ'd by Figure 1. I discover'd on that side which was next the Skin several little Holes, in some of 'em 8, 10, 15, or more, according to the bigness of the Particle; but when I view'd the same on that side which was farthest from the Body, the said Holes were closed: And I observ'd in some few of those Particles small Hairs standing out, which run into an exceeding slender Point, agreeing with the Hairs of other Creatures, which are rubbed or cut off.

That I might the better discover the Figures of the said Matter, I endeavour'd to slit some of the Particles with a sharp Knife: But I found 'em so hard, that a thin and sharp Penknife got notches in it, and its edge turn'd in the Attempt: So that I was forc'd to whet it again, till at last I had slit some to my mind; which I did more easily after I had steep'd them a little while in boiling Water.

My design in separating or dividing these Particles, was to see if I could discover in them any thing that was worth Notice: But I could not; save only, that in the dissecting of such a Particle, I met with 25 small Sands; and then I did no longer wonder that it was so hard in cutting, and made notches in my Knife.

I took a slice of one of the Particles describ'd by Figure 1. and which, as I said before, had a great many Cavities or Holes in it; and placing the same before a Microscope, caus'd it to be drawn, as you may see in Figure 2. F. G. H. I. and so it appear'd to the Painter, tho' in my Eye it was larger: But I will not determine whether these little Holes were fill'd with Hairs when they were united to the Body, nor whether those Hairs stuck so fast in the Skin, as to remain there upon the Separation of the aforesaid Particles.

I cut off a Slice from another Particle, and caus'd that to be drawn also, as you may see in Figure 3. K. L. M. N. And this Particle appear'd very wonderful to me, consisting of 10 Circles; each of which I fancied was produced at a different time, and perhaps in a Month, according as the Matter was protruded from the Skin. When I cut a Slice out of the middle of one of those Particles describ'd by Figure 1. I could see no Holes in it; no more could I, when I cut off any of the upper part, discover the least appearances that are describ'd in Fig. 3. which was occasion'd perhaps by the Elephants rubbing or lying upon those Parts.

This is what I have thought proper to communicate of my abovesaid Observations; and with great Respect I remain,

Your most humble Servant,

Anthony van Leeuwenhoek.

II. *Observations of the Eclipse of the Moon, on Jan. 12. 1711-12. By the Revd. Mr. Wm. Derham, F. R. S. In a Letter to Rich. Waller Esq; R. S. Secr.*

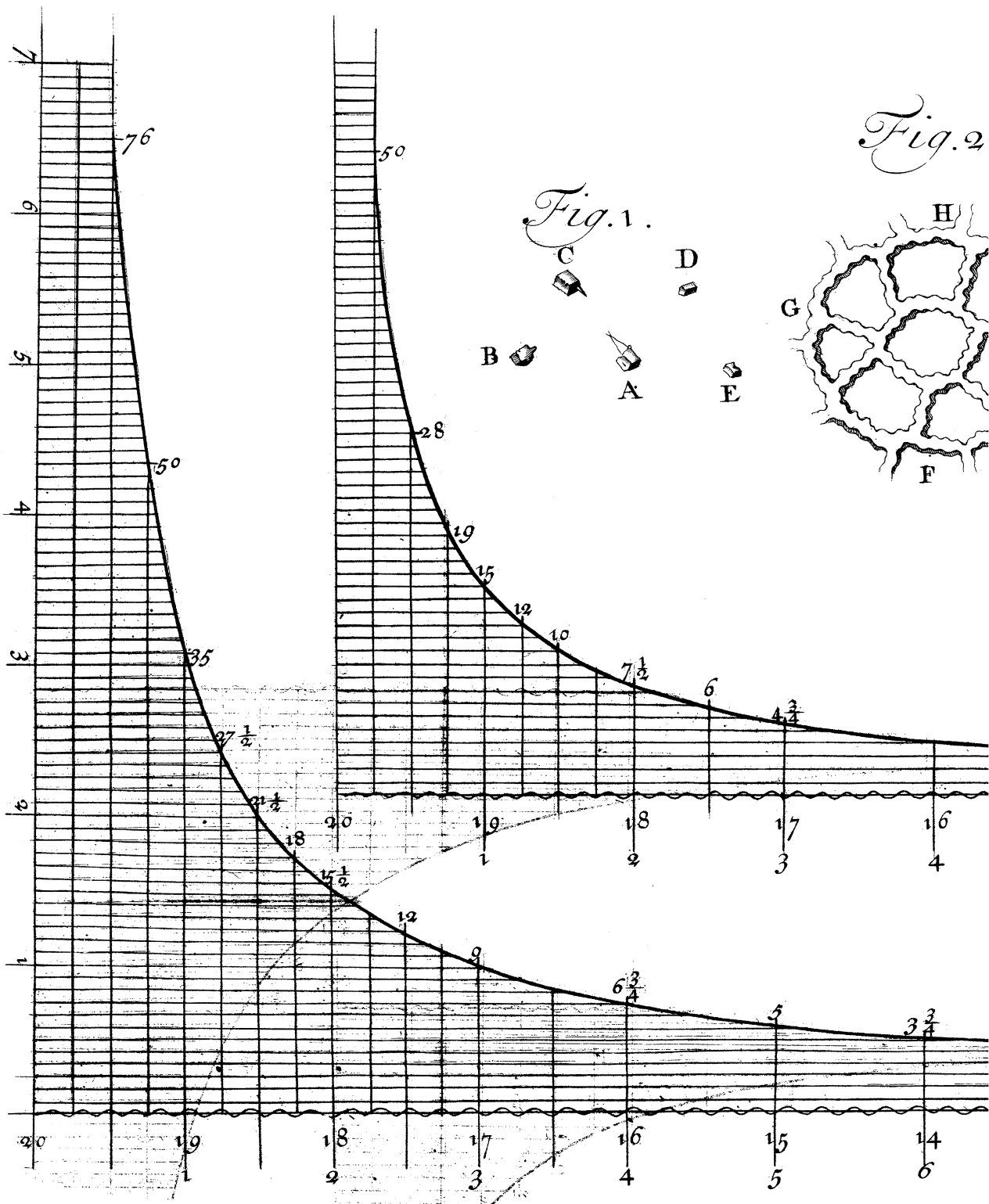
Upminster, Jan. 14. 1712.

S I R,

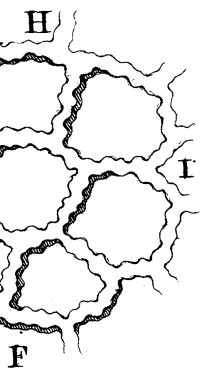
**S**aturday Evening being clear; gave me a good opportunity of observing the Lunar Eclipse. The Times are very nice, and the Observations made with an excellent Six-foot Telescope, as followeth.

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6. 15 A duskishness upon the N. East side of the Moon.
6. 36 A thick *Penumbra* on the Moon.
6. 37 The *Penumbra* so dense, that it may be taken for the Beginning of the Eclipse.
6. 39 The Eclipse undoubtedly is begun.
6. 41 The Shadow so dark; that it nearly hid the Moons N. Easternly Limb.
7. 21 Moons Diameter by the Micrometer 1612 equal parts, equal to  $31' 25''$ .

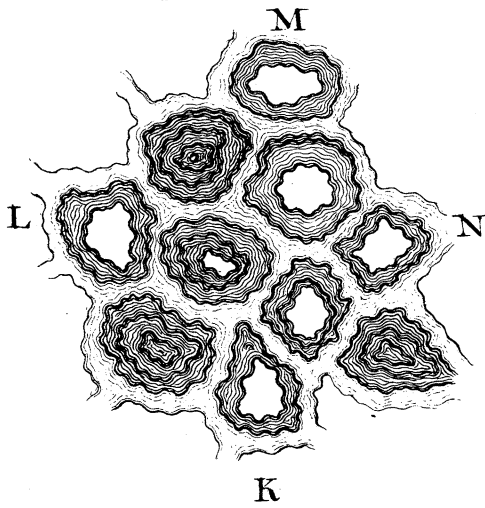
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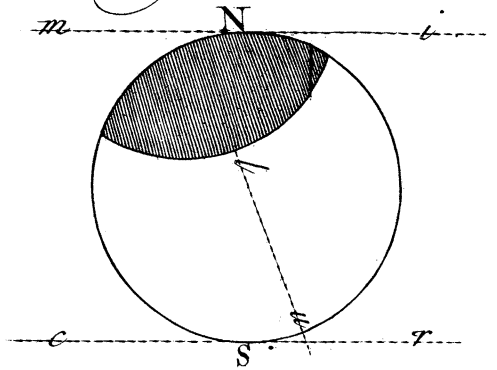
*Fig. 2.*



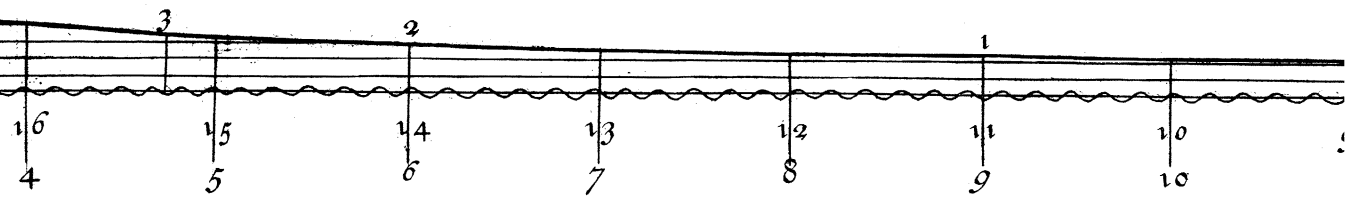
*Fig. 3.*



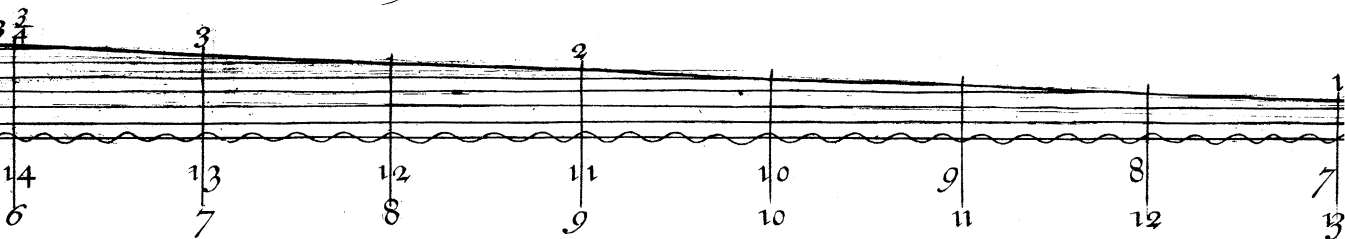
*Fig. 4.*



*Fig. 6.*



*Fig. 7.*



*Fig. 5.*

