

IV. *An Extract of a Letter from Mr. Anth. Van Leuwenhoek, Concerning Animalcules found on the Teeth; of the Scaleyness of the Skin, &c.*

I Have often endeavoured to discover Animalcules in Spittle, but in vain: But examining a kind of gritty Matter from between my Teeth, and mixing it sometimes with Rain-water, and sometimes with Spittle, both which before had no Animalcules, I discovered therein with admiration a great number of very small ones moving; the greatest whereof are represented Fig. 2. *A.* they had a very strong and swift Motion in the Water like Eeles, of these larger there were not many: A second sort is represented by *B.* these oft turned themselves round like a Top, and moved sometimes as is shewn by the Line *C.* *B.* these were much more in number. The Figure of the third sort I could not well discover, sometimes they appeared oval, and at other times round, they were so small that I could not discern them greater than as at *E.* they moved swiftly by each other like Gnats playing in the Air, and of these I discerned Thousands in a drop of Water they shewed no bigger than a Sand, and in the Drop, the Water was to the Animalcules as 9 to 1. But most of the Matter I examined, consisted of long slender parts all of a thickness, but differing in length as at *F.* and one crooked one amongst the rest; and because I have formerly observed Animalcules of this shape in Water, I endeavoured to discover if these lived but could not. I have found the same in the Matter taken from between the Teeth of  
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other Persons, as well such as drank Wine and smoaked Tobacco, as of such as did neither, but not in their Spittle, in which I found no Animalcules. I found the same after I had washed my Teeth very well with Vinegar, tho the Vinegar kill'd them when they were put into it. Amongst the rest I saw some transparent Particles twenty five times bigger than a Blood-globule, which had they not sunk down in the Liquor I should have taken for Particles of Fat.

I examined the supposed Worms taken out of the Skin of the Nose and other parts of the Face, but found them only soft brittle Particles of Fat: and perceiving on my Nose several small black Specks, I squeezed out some, and found them to be only a bundle of Hairs, and in one of these I told thirty six small Hairs besides the Matter that stuck about them. *Fig. 3.* *A B C D E*, represents one of these Hair bundles, as it shew'd in the Microscope, *A B C* was that dark part which lookt like a black Speck in the Skin; every where else they were transparent. *E D* is the Roots of the Hairs, some longer, some shorter; these Hairs are easily rubb'd off the Skin, the Nourishment thereof being not sufficient to maintain them any long time, or give them growth.

In a Letter to Mr. *Oldenburg*, in the Year, 1674. I mentioned that I could not otherwise perceive, but that the Scarf-insensible-skin consisted of small round Scales and declared my Sense of the Skins fabrick thus, That continually as it was worn away on the outside, it was supplied from beneath, and in several Observations since I have found nothing new; for viewing them always by a common Microscope they shewed as at *H, Fig. 4*, which Scales I judged of that Minuteness, that a Sand might cover two hundred or more of them; but viewing them with a better Microscope I find they are not formed by  
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the moisture transpiring through the Skin, as I then imagined; but that all the upper part of our Skin is scaly, if I may be allowed to use that word, for they are very like those of Fish, tho' they are without Comparison smaller, and serve to the same purpose, which is to defend the Skin; these Scales lay upon one another as those of Fish: they were five-sided, and I could plainly perceive a Border or Line about them, *K O P* represents a full grown Scale, *O P* the part joynd to the Skin; which was always narrower than the upper part; other Scales were not so long, nor even at the edges, being either worn or not full grown; they were as I guess'd about twenty five times broader than thick; they lay three double, for there was not about  $\frac{1}{3}$  of each visible; others lay as is represented *Fig. M.* the part 1, 2, 3, 4, being only visible; this Scale was one of the most perfect, several of the rest being not so sharp pointed; the Scales of Fish lie after the same manner, only they never shed their Scales, and our Skin peels often; sometimes a Thousand Scales and more, together in a Flake. I took of some of the Scarf-skin from a small Scar that remained from a Blood-letting twenty five Years since, and found thereon many such Scales as is represented by *L*, upon many of these Scales appeared several irregular Lines, as in *Fig. M* is represented, in some places whereof were seen very small Globules  $\frac{1}{2}$  of a Blood-globule in size; as is likewise shewn. In this part, I believe a Flea thrusts his Sting into the Skin, between the two uppermost Scales.

By these Observations I have (now as well as formerly) shewn that there are no Pores in our upper Skin, but that the Moisture thrust out of our Body gets forth between the Scales, at which places there may be possibly Channels for it to issue at: if we consider,

der; that two hundred of these Scales may be covered with a Sand, and that each Scale may have many Pores on the sides, besides the places where it is to be nourisht : we may conclude the whole Skin to be but as one continued Pore.

I then examined some of those Scales on the inside of my Hand, where the Skin was thickest, and found that they differed from the other only in that they were thicker, and beset with many Globules and Stripes; whereas the others on the Body are clearer; and whereas those on the Body fall off, and peel for want of nourishment, those on the inside of the Hand by reason of a great quantity of a clammy Matter driven out thro' the Skin are fastened to one another, so as to make a callous Substance. Labour and working likewise forcing out a greater quantity of this glutinous Matter.

