

To these Observations of Mr. *Leuwenhoek* I shall join,

III: *An Extract from the Journal Litteraire, Publish'd at the Hague, for the Months of January and February, 1714. Pag. 238. Being.*

An Account of several Observations concerning the Frame and Texture of the Muscles; By Mr. Muys of Franeker:

THE Celebrated Mr. *Muys*, who always acts for the Honour of the Academy of *Franeker*, and Advantage of Students in Physick and Anatomy, has made several Discoveries, as to the Mechanism and Texture of the Muscles of Animals; of which these are some.

He has observed, that the fleshy Fibres of the Muscles are composed of other smaller Fibres, which he calls *Fibrillæ*: that these *Fibrillæ* are of the size of a slender Hair, and that 500 or 600 of them, may be counted in one Fleishy-fibre, whose Diameter is no more than a 24th part of an Inch.

That each of these *Fibrillæ* also is made up of more than 300 little transparent *Tubuli*, but so slender, that if a Blood Globule (which, according to Mr. *Leuwenhoek*, is but the 1,000,000th part of a grain of Sand) were divided into 24 parts, one of these could hardly pass thro' these small Pipes.

He has shewn, that tho' the fleshy-Fibres of the Muscles, are joined to the Tendons and tendinous Membrane of a Muscle; yet these tendinous Fibres are not a continuation of the fleshy ones, as most Anatomists suppose: which he proves thus; If by means of a wooden Knife, or only by pulling it, you separate the fleshy Fibres from the Tendon, the end of the Tendon to which they were joined, will remain smooth and even, and not rugged.

Having

Having made several Injections of warm Water into the crural Artery of a Lamb of a Year old, all the fleshy-Fibres lost all their redness, and became entirely white. The Fibres being whitened by this Injection, he injected a coloured Liquor by the same Artery; and then not only the small Arteries appeared filled with this tinged Liquor, but he found also that the Liquor pass thro' each Fibre, either in a Serpentine manner, or undulating, or framing several Angles, or joined by a great number of *Anastomoses*.

He observed also, that many small Branches of the Arteries which before could not be seen, appeared visibly, spread all round the little *Fibrillæ*, and tinged with the same Colour.

Having remarked, that the Parts of the fleshy Fibres, which were near the Extremities of the Arteries, appeared tinged with the Liquor, he examined them with a Microscope, and found the little *Fibrillæ* filled and tinged with the same Liquor; and yet there was not least appearance of the Liquor in the *Interstices* between the *Fibrillæ*.

Having made Injections by the crural Artery, of another coloured Liquor, in the Muscles, whiten'd, as before, with Water, he saw not only the Fibres in some of the Muscles, and the most part of them in the others filled with this matter; but having examined them with a good Microscope, he found the *Fibrillæ*, and even the least *Tubuli* which compose them, filled and tinged with the same Matter; and nevertheless the small Ramifications of the Nerves appeared perfectly white.

It results from all these Observations,

1st. That the little Tubes, which make a *Fibrilla*, are really hollow, and that the Extremities of the Capillary Arteries open into them, and empty there a part of their Liquor, which is re-conveyed by the Veins to the Heart.

2d. That the Blood Globules must be divided into an almost infinite degree of smallness, before they can enter and pass these *Tubuli*. That the Blood-Globules may be so divided, and when so divided pass thro' the small *Tubuli*, is evident from

from the redness of the Fibres and *Fibrille* of Animals, which have a red Flesh; which will be no surprize to them who have read Mr. *Leeuwenhoeks* Letter 42, where he says, that these Globules do divide themselves after this manner, to pass thro' the last Extremities of the Capillary Arteries of the Brain; nor to those who know, that the Globules are extream soft and easily separable, as *Monsieur Muys* has evinced by Arguments grounded on very curious Observations.

Monsieur Muys has added to his Observations very exact Figures, which contribute very much to the forming a clear and distinct Idea of the Structure of these Fibres of the Muscles, and of the manner of the Arteries passing through them; but I dare not so far depend on my Skill in designing to venture to Copy them.

This knowing Person has also made several Discoveries of the Course and Ramifications of the Nerves in the Muscles: But I wait for an Opportunity of informing myself better of several Particularities, before I communicate them to you.

In my last I wrote to you concerning the Salts which Mr. *Muys* had discover'd in Human Blood; but I had forgot to inform you, that he had found out a way to separate them from the Blood, without any Chymical *Analysis*, and without making them undergo any change, and to form them into *Cristais*, visible without a Microscope; as he has shewn to his Students in Physick.