

presented to the Royal Academy of Sciences, by MM. BRESCHET and ROUSSEL DE VAUZEMES, on the structure and functions of the skin. In this memoir the authors endeavour to establish—

1st. That there exists in the skin an apparatus for the secretion of sweat, consisting of a glandular parenchyma which secretes this liquid, and of canals which pour it out on the surface of the body. These excretory canals are disposed in a spiral form, and open very obliquely under the scales of the epidermis.

2d. That the organs of absorption differ in some respect from the lymphatic vessels or veins, with which they nevertheless appear to communicate. These organs consist of transparent canals, of great fragility, branching or forming little arches of communication one with another, but in which we can discover no orifice or terminal mouth, which could serve for the purpose of absorption. It is this which leads us to believe that this function cannot take place by a kind of suction, but rather by imbibition, or by a mechanism, analogous to that of endosmose.

3d. That the medium in which these canals are situated, is a substance produced by a true secretion, which being strongly hygrometric, forms a body, by the medium of which the phenomenon, which we still call absorption, is effected; this absorption is only more promptly and more easily produced on mucous surfaces, because on these surfaces, the mucosity, which is analogous in more than one respect to an epidermic body, is less dense and more miscible with the liquids which are to be absorbed.

4th. That the papillary bodies are truly nervous, and the nervous filaments which enter in the composition of each papilla, do not terminate, (by bundles,) so that each fibril is free and isolated, but the nervous ramuscles appear to have terminal arches.

5th. That the papillæ are enveloped in a particular membrane, and in a layer formed by the epidermic corneous substance.

6th. That in these papillæ, sanguineous vessels of a much smaller size than the nervous filaments penetrate.

7th. That the different layers of epidermic corneous substances constitute a separate apparatus, composed of an organ of secretion and of a substance, at first placed in fibres perpendicular to the derma, but which afterwards becomes horizontal. These fibres or small stems result from the superposition of small scales; and the epidermis, properly so called, is but a part of these stems situated at the greatest distance from the derma.

8th. That in this epidermic substance, formed of scaly stems, are found absorbing canals and nervous papillæ.

9th. Finally, independently of the apparatus for the secretion of the corneous epidermic substance, there exists in the skin, towards the external face of the derma, a small apparatus for the secretion of colouring matter.—*Gaz. Méd. Feb. 8th, 1834.*

10. *Passage of Gases through Liquids.*—M. DUTROCHET has communicated to the Academy of Sciences a memoir entitled “On the Endosmose of Gases through Water.” In a former memoir, in which the author attempted to explain the respiration of aquatic insects, M. Dutrochet observed that a mutual change took place between the gases enclosed in a cavity immersed in water and the external air, the final result of which, was the transformation of the gas contained in the cavity into atmospheric air.

M. Dutrochet saw in this passage of gases in opposite directions through this liquid, a phenomenon analogous to that of the passage of liquids through a solid and permeable diaphragm—a phenomenon similar to that of endosmose. He had observed that the gases in this reciprocal exchange passed in different quantities, so that according to the nature of the mixture first placed in the bell-glass, he could have at the end of the experiment an increase or diminution of volume; he also saw that the results varied as the experiment was made

in still or running water. The object of his new work is the continuation of the researches on this subject. The first apparatus consisted of two glass tubes united at the bottom by a third, bent like a horse-shoe. This last tube was filled with water, and the two other tubes contained the same up to a certain height. The top of the two latter was occupied on one side by oxygen gas, and on the other by carbonic gas. After some time the gas passed through the water which filled the bottom of the apparatus, so that much carbonic acid was found on the side of the oxygen, and a little oxygen on the side of the carbonic acid. Besides, there was a loss of a portion of the gases, which was dissolved in the water, and by far the most considerable part of the loss was of the carbonic acid. This experiment, says M. Dutochet, had not the degree of precision necessary; however it served to show me that when two gases separated by a liquid mix, notwithstanding this obstacle, they have commenced to be dissolved in the liquid, and it is only when the latter is saturated, that the dry mixture commences. This experiment, and others in which the two gases were oxygen and azote, show that it is always the most soluble gas in water which passes in the largest quantity through this liquid towards the less soluble gas.

By prolonging sufficiently the experiment with the same gases in an apparatus a little different from the one we have described, M. Dutochet convinced himself that the change continued through the liquid until the proportions of the two mixed gases were the same in both receptacles, but there was a result he had not anticipated, which was that in the two tubes the mixture was in exact proportions to constitute atmospheric air. There had been no loss of azote but only a portion of oxygen, which was in excess, and remained dissolved in the water. The two gases in the passage of inverse directions through the water, are, according to M. Dutochet, in mixture, as are all substances that water dissolves simultaneously.

From this consideration, and others drawn from the phenomena of the mixture of two liquids of equal viscosity, separated by a partition which exercises on them a capillary action, the author is led to establish analogy between the capillary action of solids and the dissolving action of liquids.

The memoir is terminated by observations relative to the influence the state of repose or agitation of the liquids, through which the mixture is made, exercises on the results.

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11. *Influence of Gravity, and of a Depending Position on the Circulation of the Blood, in Health and in Disease.*—To appreciate properly the importance of these influences, it is proper that we attend for a few moments to the condition of the circulation in different parts of the body in its most frequent attitudes and postures; viz. the vertical or upright, and the horizontal. As the former is the most frequently repeated and longest continued, it may therefore be reasonably believed to exert a more influential operation on the current of the blood than the other. Let us consider the effect of the upright position of the body, (and this, we need scarcely say, includes the sitting, as well as the standing posture,) and we shall at once perceive that the arterial circulation in the inferior extremities is thereby facilitated, while the venous circulation is proportionally impeded. It is not therefore surprising that as the body advances in years, the operation of gravity which is acting constantly, except during sleep, against the venous current, should on many occasions induce engorgement of the veins of the leg, giving rise to varices, and to obstinate ulcers. The circumstance of these being almost peculiar to the lower limbs, can be explained only on the principle we have stated. The condition of the circulation through the head is the very reverse; the arterial current has to ascend against the gravity of the blood, whereas the venous current downwards is favoured by it. Whenever the upright posture is changed for another, say the horizontal, the circulation is very perceptibly affected; the veins of the face and neck become swollen and livid, the carotids and temporal arteries pulsate with greater force, and head-ache and confusion of thought are often induced. These phenomena are still more rapidly and